

**MOTIVATION IN PSYCHOTRAUMATOLOGY: THE RELATIONSHIP BETWEEN  
CHILDHOOD TRAUMA AND SELF-EFFICACY, SELF-CONTROL AND  
CONSCIENTIOUSNESS IN OLD AGE**

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## **ABSTRACT**

Interest in the impact of traumatic stress on motivational processes within posttraumatic stress research is still in its nascency. The cognitive and affective abilities that are involved in goal-directed behavior--and are the core of motivational analysis--are essential for the pursuit of personally meaningful goals and subsequent life adjustment and well-being. From a trauma research perspective, it can be assumed that the occurrence of a traumatic event impairs the motivational functioning of an individual.

The overall objective of this cumulative PhD thesis is to explore the largely unknown relationship between potentially traumatic events (PTE) experienced in childhood and motivational variables present in old age in a sample of Swiss former indentured child laborers. Paper 1 reviews and summarizes the literature on the most frequently studied motivation-related concepts in research on traumatic stress, such as self-efficacy, locus of control, self-esteem, and self-control/impulsivity. Paper 2 explores the association between childhood PTE and adult self-efficacy, impulsivity (self-control), and conscientiousness depending on the developmental stage in which the first traumatic event occurred. Paper 3 focuses on another facet of self-control, namely, delay discounting, and investigates the association between childhood PTE and delay discounting using a control group design with older adults without a history of PTE in childhood.

The thesis's main findings indicate the following. Very few studies consider motivation-related factors as outcome variables following traumatic stress, with almost no studies on the elderly. The strongest association seems to exist between self-efficacy and traumatic stress. Concerning the developmental stage, childhood trauma and self-efficacy/conscientiousness seem to be most strongly associated when the traumatic event occurred after the age of 10. In contrast, impulsivity and childhood trauma are most strongly related when the first trauma occurred in preschool. Lastly, individuals with PTE during

childhood display a higher delay discounting rate (or lower self-control) in old age compared to controls with no trauma exposure in their childhood.

The findings are discussed in the context of current knowledge on the relationship between traumatic stress and motivational processes. Several shortcomings of the present research and this thesis are addressed in the implications section, generating new research questions and providing suggestions for future studies. Finally, this thesis closes with implications for clinical practice.

## **ZUSAMMENFASSUNG**

Die Erforschung des Einflusses potentiell traumatischer Ereignisse auf motivationale Prozesse steckt immer noch in den Anfängen. Kognitive und affektive Fähigkeiten, die in zielgerichtetem Verhalten involviert sind und somit das Kernstück motivationaler Prozesse bilden, sind essentiell für die Verfolgung persönlich wichtiger Ziele und folglich für eine erfolgreiche Lebensführung und ein gesteigertes psychisches Wohlbefinden. Aus psychotraumatologischer Perspektive kann angenommen werden, dass das Vorkommen eines traumatischen Ereignisses das motivationale Funktionieren eines Individuums beeinträchtigen kann.

Das übergreifende Ziel dieser kumulativen Dissertation war es, die weitgehend unbekannte Beziehung zwischen potentiell traumatischen Erfahrungen (PTE) in der Kindheit und den aktuellen motivationalen Fähigkeiten im höheren Erwachsenenalter bei ehemaligen Schweizer Verdingkindern zu untersuchen. Der erste Artikel präsentiert eine Zusammenfassung des bisherigen Forschungsstands bezüglich der meistuntersuchten motivationalen Konzepte in der Traumaforschung, nämlich Selbstwirksamkeit, Kontrollüberzeugungen, Selbstwert und Selbstkontrolle/Impulsivität. Der zweite Artikel befasst sich mit der Beziehung zwischen PTE in der Kindheit und Selbstwirksamkeit, Impulsivität (Selbstkontrolle) und Gewissenhaftigkeit im höheren Erwachsenenalter in Abhängigkeit der Entwicklungsstufe in der das erste PTE statt fand. Im dritten Artikel wurde der Fokus auf eine andere Facette der Selbstkontrolle, nämlich Delay Discounting (Diskontieren), gelegt. In einem Kontrollgruppendesign (ehemalige Verdingkinder versus Kontrollgruppe ohne PTE in der Kindheit) wurde die Assoziation zwischen PTE in der Kindheit und der Diskontrate im höheren Erwachsenenalter exploriert.

Die wichtigsten Befunde der Dissertation lauten wie folgt: Es besteht ein Mangel an Studien, die motivationale Faktoren als Resultat nach traumatischen Erfahrungen betrachten

und auch Stichproben mit älteren Personen berücksichtigen. Der stärkste Zusammenhang scheint zwischen Selbstwirksamkeit und posttraumatischem Stress zu bestehen. In Abhängigkeit entwicklungspsychologischer Stadien scheinen PTE in der Kindheit und Selbstwirksamkeit/Gewissenhaftigkeit den stärksten Zusammenhang aufzuweisen, wenn das traumatische Erlebnis nach dem 10. Lebensjahr statt fand. Demgegenüber scheinen Impulsivität und PTE in der Kindheit am stärksten assoziiert zu sein wenn das erste traumatische Erlebnis sich im Vorschulalter ereignete. Schliesslich weisen im Vergleich zu Älteren ohne PTE in der Kindheit, ehemalige Verdingkinder eine höhere Diskontrate (oder geringere Selbstkontrolle) im höheren Erwachsenenalter auf.

Die Ergebnisse der Dissertation werden im Kontext des gegenwärtigen Wissensstands diskutiert. Sowohl Schwächen der bisherigen Forschung als auch der vorliegenden Dissertation werden aufgenommen, mit dem Ziel, daraus neue Forschungsfragen zu generieren und Anregungen für zukünftige Studien vorzuschlagen. Die Dissertation schliesst mit Implikationen für die klinische Praxis.

# **1 BACKGROUND: Traumatic Stress and Motivation**

## **1.1 Introduction**

Experiencing potentially traumatic events is a recurrent phenomenon throughout the life course. As reported in the European Study of the Epidemiology of Mental Disorders Survey (ESEMeD), 63.6% of respondents experienced at least one potentially traumatic event during their life-span (Darves-Bornoz et al., 2008). For example, epidemiological studies with adults report a lifetime prevalence of at least one potentially traumatic event of nearly 50% in Germany (Maercker, Forstmeier, Wagner, Glaesmer, & Brähler, 2008) and approximately 80% in the Netherlands (de Vries & Olf, 2009). At the same time, traumatic and aversive experiences do not stop at the boundaries of childhood. The World Mental Health surveys, conducted in nine countries, revealed a prevalence of childhood adversities of approximately 38%, with parental death being the most frequently mentioned adversity, followed by physical abuse, family violence, and parental mental illness (Kessler et al., 2010). Adversities that occurred within a family context (e.g., child abuse, parental mental illness, experience of neglect) served as the most important predictors of disorders.

One question that arises is how people with early traumatization manage their lives in the context of aging. How do they motivate themselves to meet personal, familial, or societal requirements? More importantly, does the trauma affect their motivation to engage in activities that are necessary for their personal development? The present cumulative PhD thesis treats in three research papers the association between traumatic stress early in life and motivational processes in late adulthood. It adds to the literature by reviewing present research (*paper 1*), considering the developmental perspective in the context of trauma and motivation (*paper 2*), and then focusing on differences in motivational processes between elderly persons with and without early trauma exposure (*paper 3*).

Prior to presenting the three papers in section 4, in the first section, relevant information on potentially traumatic events in early childhood and their long-term sequelae is provided, followed by theoretical frameworks on psychological adjustment after trauma and general motivational functioning. This section closes with an overview of recently published work on the relationship between trauma and motivation-related concepts as a complement to *paper 1*. Subsequently, section 2 presents short summaries of the three research papers. In section 3, the findings are integrated, and implications for research and clinical practice are derived. Finally, the manuscripts of the three papers are attached in section 4.

## **1.2 Potentially Traumatic Events in Early Life**

In the literature on child abuse, the terms childhood trauma and childhood maltreatment have sometimes been used interchangeably (De Bellis, 2001). On one hand, according to the DSM-IV definition, a traumatic event includes exposure to “actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (American Psychiatric Association, 2000, p. 491). As such, child sexual abuse and child physical abuse represent prototypical trauma stressors (Cloitre et al., 2009). However, on the other hand, child maltreatment has been defined to include both acts of commission and omission by caregivers causing or intending to cause serious harm to a child (Barnett, Manly, & Cicchetti, 1993). Four types of maltreatment in childhood, namely, physical abuse, sexual abuse, emotional abuse, and neglect, have received wide recognition in the literature (Barnett, Manly, & Cicchetti, 1993; Leeb, Paulozzi, Melanson, Simon, & Arias, 2008; Manly, Kim, Rogosch, & Cicchetti, 2001). Although a consensus on the definitions of maltreatment appears not to have been fully reached yet (Cicchetti & Toth, 2005; Runyan et al., 2005), current research widely agrees that potentially traumatic events during childhood and adolescence include stressors related to the experience of abuse and neglect (Bernstein et al., 1994; 2003). Abusive

experiences can be described as physical (serious physical maltreatment potentially leading to injury), sexual (any sexual behavior between an adult or older person and a child), and/or emotional (threatening a child's self-worth by verbal insult or humiliation) abuse. Similarly, neglect can be described as physical (the caregiver's failure to meet the basic needs of a child) and/or emotional (the caretaker's inability to provide the child with basic emotional needs).

As mentioned above, potentially traumatic events in childhood and adolescence are frequent. For example, in a representative community sample of adolescents and young adults (age ranging from 14 to 24 years) in a large city in Germany, a prevalence rate of 21.4% was reported (Perkonigg, Kessler, Storz, & Wittchen, 2000). In a nationwide representative sample of adolescents (the vast majority between 14 and 17 years old) in Switzerland, the authors identified a prevalence rate of experiencing at least one potentially traumatic event of 56.1% (Landolt, Schnyder, Maier, Schoenbucher, & Mohler-Kuo, 2013). The large difference in the prevalence rates might be the result of the use of different instruments for assessing potentially traumatic events (broader definition in the study by Landolt et al., 2013) or the educational background of the participants, i.e., 9<sup>th</sup> grade public schools (Landolt et al., 2013) versus predominantly gymnasium (Perkonigg et al., 2000).

Potentially traumatic experiences can dramatically impact the whole being of a person, as research has shown. Childhood abuse is a risk factor for developing various disorders, such as PTSD (Brewin, Andrews, & Valentine, 2000), borderline personality disorder (Zanarini et al., 2002), and chronic diseases (Miller, Chen, & Parker, 2011). In comparison with non-maltreated children, children with a history of abuse display dysfunctions in various domains of psychological functioning, such as emotions (Shields & Cicchetti, 1998) and cognition (Bücker et al., 2012), as well as structural changes in different brain regions (Frodl & O'Keane, 2013). Furthermore, there is evidence from epidemiological studies that trauma events caused by humans (so-called man-made or interpersonal trauma) are the most horrific

experiences and result in PTSD more frequently than other types of potentially traumatic events (Kessler et al., 1994). It seems that children with the simultaneous occurrence of physical and sexual maltreatment beginning at a young age are at the greatest risk for developing mental disorders (Ackerman, Newton, McPherson, Jones, & Dykman, 1998).

In the following, empirical findings on the long-term consequences of childhood trauma and maltreatment as well as a theoretical framework regarding human adaptation in the aftermath of trauma, namely, social cognitive theory, will be presented.

#### 1.2.1 Long-term sequelae of potentially traumatic events in childhood

The association between childhood victimization and adult psychological outcomes is complex. Some studies have monitored psychological development after early trauma exposure up to middle adulthood, but studies conducted on samples with older adults are rare.

In a representative sample of children aged 9 to 13 years who were surveyed again at the age of 16, Copeland, Keeler, Angold, and Castello (2007) found that more than two thirds of those children had experienced at least one potentially traumatic event. The authors reported a relationship between traumatic events and various psychopathological conditions, with depression, PTSD, and other anxiety disorders being the most frequent correlates. A prospective study with a follow-up 20 years after the first investigation at age 11 and younger reported more dysthymia and antisocial personality disorder in individuals with sexual or physical abuse or neglect during childhood compared to a matched sample with no such experiences (Horwitz, Spatz, Widom, McLaughlin, & Raskin White, 2001). Further findings from a longitudinal investigation showed that child abuse is highly prevalent and represents a risk factor for psychopathology in adulthood, as assessed 30 years later (Collishaw et al., 2007).



Less well studied are the long-term sequelae of childhood adversities and potentially traumatic events in late and very late adulthood. A meta-analysis found that six decades after World War II, Holocaust survivors, compared to individuals without this experience, showed worse adaptation in various areas of functioning (Barel, van IJzendoorn, Sagi-Schwartz, & Bakermans-Kranenburg, 2010). However, looking at nonselect samples, i.e., samples with recruitment strategy that targets a large community consisting of Holocaust survivors and nonsurvivors and, contrary to the select method, does not make use of convenience samples (e.g., recruitment through survivors' organizations), the effects turned out to be small, except for posttraumatic stress symptoms, which were higher in the Holocaust survivor group.

Further findings from older populations indicate that early life adversities are related to higher risk for mental disorders (Kessler et al., 2010; Kraaij & de Wilde, 2001; Muhtz et al., 2011), such as depression (Kuhlman, Maercker, Bachem, Simmen, & Burri, 2013; Ritchie et al., 2009); impaired cognitive functioning (Bremner & Narayan, 1998; Burri, Maercker, Krammer, & Simmen-Janevska, 2013; Hedges & Woon, 2011; Marin et al., 2011); higher cardiovascular morbidity (Alastalo et al., 2009); and worse psychosocial adjustment (Wilson et al., 2006). In addition to the negative impact of experiencing adverse or potentially traumatic events during childhood on subsequent health status, being separated from one's parents represents a serious stressor for a child. In a country-specific research program with British and Finnish child evacuees during World War II, the negative effects of adverse childhood experiences on mental health, such as a greater risk for depression (Pesonen et al., 2007; Rusby & Tasker, 2009) or lower levels of psychological well-being (Foster, Davies, & Steele, 2003; Pesonen & Räikkönen, 2012), were demonstrated, even decades later.

Additionally, it is of ultimate importance to consider the developmental perspective in studying the long-term effects of childhood trauma and adversity (Juster et al., 2011; Kim-Cohen, 2007; Koenen, Moffitt, Poulton, Martin, & Caspi, 2007; Maercker, Michael, Fehm,

Becker, & Margraf, 2004; Pesonen & Räikkönen, 2012). Findings from cross-sectional studies indicate that in old adults, trauma exposure in early school years (6-11 years) is related to a worse health status than trauma exposure at a younger age (<6) (Krause, Shaw, & Cairney, 2004). Furthermore, one study with Holocaust survivors found that a younger age at trauma exposure was associated with less intrusive thoughts and nightmares relative to survivors who were older at the time of the event (Yehuda, Schmeidler, Siever, Binder-Brynes, & Elkin, 1997). Moreover, findings from one study suggest that those with early parental separation (4-6 years) report more depression and clinical anxiety in old age than those separated during adolescence (13-15 years) (Rusby & Tasker, 2009). However, another study with older adults found that those who were separated in infancy (<2 years) and school age (7-11 years) showed the greatest vulnerability for severe depressive symptoms in old age compared to those who experienced parental separation between the ages 2 and 6 (Pesonen et al., 2007). In contrast, one study could not find a significant association between age at separation and PTSD and depression in old age (Strauss, Dapp, Anders, von Renteln-Kruse, & Schmidt, 2011).

Overall, it is evident that early exposure to traumatic events can have a negative impact in later stages of life. Nevertheless, the consequences for late adulthood have not been sufficiently explored. Several researchers have emphasized the investigation of potential moderators, such as age at the onset of a potential traumatic event, when studying long-term consequences of early life adversities (Foster, et al., 2003). Young children up to preschool age develop their self-regulation abilities by learning from models, usually the primary caregiver, and are particularly vulnerable to the negative effects of maltreatment (Crusto et al., 2010). Because, as already mentioned, research suggests a negative influence of separation from the original family on children's health, the next subchapter will give a brief overview of research conducted with children in foster or residential care.

### 1.2.2 Empirical findings from studies on children in residential or foster care

With regard to the mental health status of children living in residential or foster care, it becomes obvious that research is rather limited (Pérez, Di Gallo, Schmeck, & Schmid, 2011). Surprisingly, to date, there is also no official statistical record available of the exact number of children living in foster care in Switzerland (Zatti, 2005); however, estimates suggest that approximately 15,000 children are affected (Pflegekinder-Aktion Schweiz, 2010).

Children living in foster care placement are psychologically burdened. One study found that 82% of the interviewed foster care children have experienced at least one traumatic event, 69% of which were man-made traumas (Pérez et al., 2011). In addition, more than two thirds (68%) reported clinically relevant values regarding psychopathology and had to cope with a highly pronounced psychological strain. Individuals in the foster care system typically report multiple abusive experiences and already suffer from at least one mental disorder before the beginning of the out-of-home placement (McMillen et al., 2005). For example, McMillen et al. (2005) found that 77% of the adolescent study participants who were either sexually or physically abused also reported an additional maltreatment type. The prevalence rate for major depression before entering the foster care system was 35%, with an average age at onset of approximately 12 years. Another study found a PTSD prevalence of as high as 60% among sexually abused children who entered foster homes (Dubner & Motta, 1999). These results were confirmed in a literature review that addressed the question of the incidence of exposure to traumatic events in foster care children (Oswald, Heil, & Goldbeck, 2010). The vast majority experienced neglect (18-78%) in their families of origin, followed by physical (6-48%) and sexual (4-35%) abuse. Not only had the children experienced multiple forms of maltreatment, they also showed long-term developmental deficits accompanied by mental disorders.

Little research addresses the question of which type of experiences children are confronted with in their out-of-home facilities. Approximately one third of the participants in one study reported having experienced maltreatment in their foster family, such as emotional or physical neglect or abuse (Tarren-Sweeney, 2008). In most cases, this maltreatment was a result of the caregiver's inability to face the excessive demands of caring for foster children. However, an additional finding from the same study indicates that entering the care system at a younger age acts as a protective factor in predicting mental health. In another study, 60% of the persons interviewed specified being physically abused in their foster family homes, whereas 17% reported neglect and approximately 11% reported sexual abuse (Benedict, Zuravin, Brandt, & Abbey, 1994).

In summary, individuals with a history of foster care placement seem to be disadvantaged in several respects compared to their counterparts without out-of-home placement (Schneider et al., 2009). For example, they report poorer health (including poorer mental health), lower levels of education, higher unemployment rates, and worse living conditions. A review article concludes that children living in foster care are at higher risk for developing behavioral and emotional maladaptation (Jones & Morris, 2012). On the other hand, research has identified factors for beneficial outcomes in the adjustment of foster care children, including the presence of self-serving features (e.g., setting positive goals or perceiving personal strengths). At present, despite some weaknesses (e.g., a time frame of 1998-2009, only English-language articles, no apparent systematic approach), the only reasonably methodologically solid publication investigating mental health in foster care children considering the trauma history seems to be the literature review conducted by Oswald and colleagues (2010). The authors conclude from 32 analyzed articles that children in the foster care system report very high rates of abusive experiences, deficits in development (e.g., cognitive functioning), and a high prevalence of mental disorders.

### 1.2.3 Human adjustment following trauma

Various theoretical conceptualizations have been elaborated and applied in research on post-traumatic adaptation. In a comprehensive overview, Benight (2012) summarizes the most frequently used frameworks. Because self-regulatory processes form the core of this PhD thesis, only general social cognitive theory (Bandura, 1997) will be described in detail, despite not being specific to trauma sequelae and PTSD.

#### *Social cognitive theory*

Social cognitive theory represents an approach to explaining human functioning considering three key forms of human activity: *personal, proxy, and collective* (Bandura, 2001). To achieve a desired outcome, humans sometimes have to overcome barriers that are not under their direct, personal control. In these cases, people refer to proxies that might dispose of more appropriate means and provide support (e.g., marital partners turn to their spouses). In addition, humans belong to collectives and can use them to collaborate with others and accomplish their undertakings. Within this framework, the operating component is the *triadic reciprocal determinism*, including the interplay of three factors: *behavior, cognition and other personal factors, and environment* (Bandura, 1997). This structure implies causal interactions between individual factors linked by self-regulatory mechanisms. The central element in the self-regulatory process is *self-efficacy* (Bandura, 1989), i.e., the perception of one's personal efficacy to generate and control incidents in one's life (Bandura, 1982). Further details on self-efficacy will be provided in section 1.3.2.1.

Benight and Bandura (2004) applied this theory to PTSD, arguing that motivational processes (e.g., goal striving) are essential for successful adjustment after trauma, which, in turn, are reliant on favorable self-efficacy beliefs. According to the theory, activating feelings of personal efficacy is the first step required for adaptation (Bandura, 1997). Because many

trauma victims pursue avoidance goals, their self-efficacy needs to be increased so that they can seek corrective experiences. More precisely, individuals who believe that they are able to overcome the burden caused by the traumatic event take an active role in coping with their traumatization instead of engaging in resignation (Benight & Bandura, 2004). Empirical findings support the assumption that self-efficacy has a positive impact on recovery from trauma (Luszczynska, Benight, & Cieslak, 2009).

### **1.3 Motivation in Psychotraumatology Research**

Motivation is crucial for human development and successful adaptation to the demands of everyday life (Brunstein, Schultheiss, & Maier, 1999; Elliot, Thrash, & Murayama, 2011). Generally, humans seek to steer their personal development in a desired direction by regulating motivational processes, such as goal striving (Heckhausen, Wrosch, & Schulz, 2010). Numerous theoretical approaches have illuminated the role of self-regulation as a key component for successful goal achievement (Carver & Scheier, 1998; Gollwitzer, 1999; Kuhl, 2000a; Kuhl, Kazén, & Koole, 2006). As a supplement to the presented theoretical background on motivation in *paper 1* (see page 68 and following), the following sub-sections include (1) theoretical background on motivational processes involved in goal striving, (2) a brief theoretical portrayal of motivation-related concepts studied in trauma research, and (3) the corresponding empirical findings.

#### **1.3.1 Current motivational theorizing on goal striving**

Although different theories have been developed to explain human behavior towards goal setting and goal implementation, such as the Rubicon model of action phases (Heckhausen & Gollwitzer, 1987) or the theory of action control (Kuhl, 1984), only relatively new approaches, namely, the strength model of self-control (Baumeister, Bratslavsky, Muraven, & Tice, 1998)

and the motivational theory of life-span development (Heckhausen et al., 2010), will be outlined in the following.

*Selected theoretical frameworks: Strength model of self-control*

Baumeister and colleagues developed the strength model of self-control and coined the term ego depletion (Baumeister & Heatherton, 1996; Baumeister et al., 1998; Baumeister & Vohs, 2007; Baumeister & Tierney, 2011; Muraven & Baumeister, 2000). Within this framework, self-control refers to the ability to control one's own thinking, feelings, and behavior (Muraven & Baumeister, 2000). In the literature, synonymous terms, such as willpower, self-discipline, or self-regulation, have frequently been considered and used interchangeably (Hagger, Wood, Stiff, & Chatzisarantis, 2010). The model postulates that all activities requiring self-control draw their energy from the same resource storage, which is limited and eventually becomes exhausted. The authors compare the process to a muscular activity "that becomes fatigued by exertion and becomes less able to function" (Muraven & Baumeister, 2000, p. 248). This exhaustion of willpower is referred to as *ego depletion*. More specifically, after exerting control over the self, individuals may have less self-control at their disposal for a subsequent self-control activity.

A series of experimental studies have been conducted to test the effect of self-control performance on ego depletion and have found evidence for the hypothesis that demanding self-control actions lead to a certain disability in subsequent tasks that require self-control as well (see Hagger et al., 2010; Muraven & Baumeister, 2000, for review). However, some indices suggest that this relationship might be moderated by motivation (Muraven & Slessareva, 2003). Already depleted individuals who consider the subsequent exercise as meaningful (i.e., high-motivation individuals) showed better performance in self-control than unmotivated depleted individuals. Nevertheless, there is also evidence that repeatedly

exercising self-control seems to strengthen the capacity for performing self-control in the long term (Baumeister, Gailliot, DeWall, & Oaten, 2006). Implications of the strength model for clinical psychology have been marginally discussed in the literature (Baumeister & Exline, 2000; Baumeister, 2002). Whether experiencing traumatic stress may result in ego depletion still needs to be clarified (Baumeister et al., 1998).

*Selected theoretical frameworks: Motivational theory of life-span development*

Another contemporary approach in motivation psychology taking into account the developmental perspective is the motivational theory of life-span development (Heckhausen et al., 2010). According to this theory, the central element for successful development over the life span is the degree of control an individual experiences with regard to his or her environment and various areas of life. Thus, the person directs his or her effort towards pursuing developmental goals, which implies a modulation of life in the desired direction. This occurs by an adaptive application of primary and secondary control strategies. Primary control processes are oriented toward changing the environment to become compatible with one's perceptions, whereas secondary control processes target the change of the self to fit the environmental state. The theory specifies 15 assumptions which the authors cluster into four empirically testable categories: "(a) the adaptiveness of primary control; (b) life-span trajectories of primary and secondary control; (c) optimization of goal choice and appropriate use of control strategies; and (d) action phases of goal choice, goal engagement, goal disengagement, and new goal engagement" (Heckhausen et al., 2010, p. 41).

There is substantial empirical evidence for each of the 15 propositions formulated within the motivational theory of life-span development (Haase, Heckhausen, & Wrosch, 2013; Heckhausen et al., 2010). With regard to the possible application of the theory to research on traumatic stress, one particular prospective longitudinal study should be



mentioned. This study investigated the impact of a stressful life event (in this study, the death of a family member or parental divorce) on control striving (expectancy beliefs that one can control the environment and one's goals) (Poulin & Heckhausen, 2007). The authors hypothesized that exposure to stressful life events would induce diminished control striving, which was supported to a large extent. Adolescents who experienced a stressful event were less convinced that finding an apprenticeship was something they could control. Furthermore, the study identified secondary control strategies (e.g., preventing parallel execution of competing goals) as acting as protective factors. More precisely, with regard to time-critical goals, individuals who adapted more secondary control strategies did not display diminished control striving in comparison to those who did not make use of such strategies. Some assumptions of the motivational theory of life-span development have been applied in studying particular stressful transitions across the life-span; however, these studies have mainly been outside the field of clinical psychology (Löckenhoff, 2012; Thompson et al., 2006; Wrosch, Scheier, Miller, Schulz, & Carver, 2003).

In summary, initial studies on the impact of stressful life events on motivational processes have generated interesting results. To further illustrate this point, van Dijk, Seger-Guttmann, and Heller (2013) conducted a longitudinal study on the relationship between life-threatening events (missile attacks) and avoidance/approach motivation. Compared to the control group with no exposure, the participants who were exposed to the attacks showed a more pronounced avoidance motivation, whereas there were no significant differences in approach motivation. Furthermore, in the group under life threat, the level of avoidance motivation decreased in the long term, i.e., six months after the attacks, and remained stable one year later. In contrast, there was no association between approach motivation and the threat

condition, which the authors interpret as in accord with the approach-avoidance theory, as the two motivational systems operate independently from each other (Elliot, 2008).

Thus, it is astonishing that only a handful of studies have investigated the possible effects of stressful events on motivational processes.

### 1.3.2 Motivation in psychotraumatology research: related concepts

In the following subchapters, the motivation-related constructs that constitute the centerpiece of the present PhD thesis will be briefly outlined. Subsequently, in section 1.3.3, empirical evidence on the relationship between trauma exposure and motivation-related constructs will be provided. Thereby, only newly published work that extends the findings already reported in *papers 1, 2, and 3* will be presented.

As discussed in previous chapters and comprehensively described in the review article (*paper 1*), motivational components of self-evaluation have frequently been taken into consideration in research on psychotraumatology. These components include self-efficacy, locus of control, and self-esteem (Judge, Erez, Bono, & Thoresen, 2002). Moreover, the role of self-control (or impulsivity) has strongly been emphasized in trauma research (Walter, Gunstad, & Hobfoll, 2010). Delay discounting, as a facet of self-control (Forstmeier, Drobetz, & Maercker, 2011) and being strongly related to impulsivity (Ostaszewski, 1996), and the related concept of conscientiousness (John & Srivastava, 1999) have recently attracted increasing attention in trauma research.

#### 1.3.2.1 Self-efficacy

Self-efficacy, introduced by Albert Bandura, is defined as "people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). It represents the individuals' subjective perception of

his or her ability to mobilize his or her cognitive, behavioral, motivational, and social competencies to fulfill certain requirements that pertain to different areas of life (Bandura, 1982).

Self-efficacy has received broad attention in psychological research as a whole, resulting in numerous meta-analyses all of which unanimously agree that efficacy beliefs have a positive effect on human functioning (Benight & Bandura, 2004).

#### 1.3.2.2 Locus of control

Locus of control refers to the “degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself” (Rotter, 1966, p. 1).

Locus of control has been studied in psychological research as much as self-efficacy, with one of the major findings being that people with a strong external locus of control display higher psychopathology, lower academic performance, and increased delinquency (Twenge, Zhang, & Im, 2004).

#### 1.3.2.3 Self-esteem

Self-esteem denotes how much worth people ascribe to their own selves (Baumeister, Campbell, Krueger, & Vohs, 2003). Derived from different underlying definitions, self-esteem is the one’s evaluation of the self, which is to be highly regarded and defended when threatened (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Self-esteem epitomizes one of the basic human needs and is affected by validation or invalidation through other individuals.

Although a substantial number of studies have emphasized the benefits of high self-esteem, in the last decade, this beneficial relationship has begun to be questioned (Baumeister,

Smart, & Boden, 1996; Crocker & Park, 2004). However, in trauma research, the significance of beliefs about the self has been widely acknowledged (Brewin & Holmes, 2003).

#### 1.3.2.4 Self-control/Impulsivity

Self-control includes “the capacity for altering one’s own responses, especially to bring them into line with standards such as ideals, values, morals, and social expectations, and to support the pursuit of long-term goals” (Baumeister, Vohs, & Tice, 2007, p. 351). It means defying impulsive actions (Baumeister & Alquist, 2009) and is therefore seen as the opponent of impulsivity (Hofmann, Friese, & Strack, 2009).

High self-control has been associated with better psychological well-being (Tangney, Baumeister & Boone, 2004) and beneficial health behaviors (Melanko & Larkin, 2013).

#### 1.3.2.5 Conscientiousness

Conscientiousness depicts one’s proneness to pay attention to socially established norms and principles for impulse control, to be goal-oriented, to plan, and to possess the ability to delay gratification (John & Srivastava, 1999). Restraint, discipline, and self-control are additional positive components that constitute conscientiousness (Bogg & Roberts, 2004).

Conscientiousness has been found to increase with age, suggesting that people become more conscientious as they grow older (Roberts, Walton, & Viechtbauer, 2006). Conscientious individuals engage in behaviors that promote health (Roberts, Walton, & Bogg, 2005) and perform well academically (Poropat, 2009). Furthermore, in the context of expectancy motivation, conscientiousness has been established as strongly correlated with goal setting (Judge & Ilies, 2002). In clinical psychology, findings indicate that low levels of conscientiousness are closely related to increased psychopathological burden (Goodwin & Friedman, 2006).

#### 1.3.2.6 Delay discounting

Delay discounting is “the reduction in the present value of a future reward as the delay to that reward increases” (Kirby, Petry, & Bickel, 1999, p. 78). The concept is similar to the delay of gratification, which is defined as the voluntary renunciation of an immediate reward for the sake of a greater reward in the future (Mischel, Shoda, & Rodriguez, 1989).

Choosing a smaller, immediate monetary incentive instead of a larger fee later has been associated with increased deficits in self-regulation and academic performance (Wulfert, Block, Santa Ana, Rodriguez, & Colsman, 2002). In another study, children with the inability to persistently wait for delayed rewards showed more externalizing, i.e., aggressive and delinquent, behaviors and were less conscientious and goal-oriented compared to those with lower delay discounting (Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, 1996). Delay discounting is subject to a life-span developmental trend. Empirical findings suggest that children display the highest and older adults the lowest discounting rates (Green, Fry, & Myerson, 1994). However, these results have been challenged in another study that found older individuals to discount more than younger, with middle-aged people discounting less than the two other groups (Read & Read, 2004).

Some of the constructs presented are strongly intercorrelated. A meta-analytical study reported estimated population correlations of .52 between locus of control and self-esteem, .56 between locus of control and self-efficacy, and .85 between self-efficacy and self-esteem (Judge et al., 2002). However, despite the overlap, there are strong arguments for treating them separately. For example, although self-efficacy and self-esteem overlap, they are still distinct concepts (Walter, Horsey, Palmieri, & Hobfoll, 2010). They act jointly in that self-esteem ensures that one deserves to pursue a certain activity, whereas self-efficacy supports the conviction that one is capable of realizing that intention. Self-efficacy is essential

for motivational processes, as it affects decision-making, goal striving, and persistence (Gist & Mitchell, 1992). It bears similarities to self-esteem, which represents an affective evaluation of the self; however, self-efficacy primarily judges one's own capability to perform and does not necessarily undertake an evaluative attribution. Their conceptual differences have been extensively debated in the literature (Chen, Gully, & Eden, 2004). There are also similarities between the concepts of self-efficacy and controllability (locus of control), which, however, should be treated as independent of each other as well (Ajzen, 2002).

### 1.3.3 Motivation in psychotraumatology research: empirical findings

The next section presents studies obtained using the same literature search procedure as conducted in *paper 1* (for a more detailed description see page 74), with the exception of the inclusion of the relationship between potentially traumatic events and conscientiousness as well. Only additional literature on conscientiousness that was not part of *paper 2* was considered. No studies were found on the relationship between delay discounting and trauma that had not already been considered in *paper 3*. For this reason, research regarding this relationship will not be repeated here. In the final analysis, peer-reviewed work published from September 2011 to November 2013 was considered, resulting in 38 publications that were identified as relevant.

#### 1.3.3.1 Self-efficacy

Only one longitudinal study (Table 1) on self-efficacy was found, reporting a weak negative longitudinal association between self-efficacy and exposure to trauma (Bosmans et al., 2013). However, self-efficacy was only investigated at the last measurement point; thus, its independent predictive value over the time course cannot be assessed.

**Table 1.** *Self-efficacy: longitudinal findings (supplementary to paper 1)*

Authors	Sample	Design	Main Finding
Bosmans, Benight, van der Knaap, Winkel, & van der Velden, 2013	Fireworks Disaster (N=514) Adulthood Mixed Gender (F=58.6%)	1 group Assessment at 2-3 weeks, 18 months, 4 years, and 10 years post-disaster	$r=-.14^*$ between CSE (T4) and disaster exposure (T1) $r=-.62^{***}$ between CSE (T4) and posttraumatic stress (T3) $r=-.72^*$ between CSE (T4) and posttraumatic stress (T4) CSE (T4) and posttraumatic stress (T3) predicts posttraumatic stress at T4 CSE (T4) partially mediates relation between posttraumatic stress (T3) and posttraumatic stress (T4) No gender differences regarding CSE at T4

Note. CSE=Coping Self-Efficacy; Gender F=Female; Childhood/Adolescence=0-21 years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years); \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

Table 2 provides an overview of cross-sectional studies investigating the relationship between self-efficacy and traumatic stress. With the exception of two studies, which found either a positive or no relationship between self-efficacy and trauma exposure and traumatic stress symptoms, the remaining studies report weak to moderate significant negative associations between the two constructs. In addition, one study (Lambert et al., 2013) examined the mediating role of self-efficacy.

**Table 2.** *Self-efficacy: cross-sectional findings (supplementary to paper 1)*

Authors	Sample	Design	Main Finding
Connolly, Aitken, Tower, & Macfarlane, 2014	Various Body Injuries (N=88) Adulthood Mixed Gender (F=19.3%)		$\beta=-0.09$ , $p<.001$ between PTSD and self-efficacy
Ness, & Vroman, 2014	Military Service Members (N=192) Early Adulthood Mixed Gender (F=21.9%)	1 group	$r=-.39^{**}$ between self-efficacy and PSS Lower self-efficacy in service members with traumatic brain injury or PTSD or both vs. individuals neither with traumatic brain injury nor PTSD
Barry, Whiteman, & MacDermid Wadsworth, 2012	Military-Affiliated and Civilian Students (N=248) Early Adulthood Mixed Gender (F=38.3%)	4 groups (combat-exposed vs. non-combat exposed vs. Reserve Officers' Training Corps (ROTC) vs. civilians)	Combat-exposed and ROTC: no relation between self-efficacy and PSS Non-combat exposed and civilians: negative relation between self-efficacy and PSS
Hruska & Delahanty, 2012	Various Potentially Traumatic Events (N=144) Adolescence Mixed Gender (F=69%)	1 group	$r=-.47^{***}$ between self-efficacy and PSS

**Table 2. (continued)**

Authors	Sample	Design	Main Finding
Lambert, Benight, Harrison, & Cieslak, 2012	Firefighters ( $N=277$ ) Early Adulthood Male	1 group	$r=-.28^{**}$ between CSE and PSS $\Delta R^2=.05^{**}$ CSE predicts PSS
Lambert, Benight, Wong, & Johnson, 2013	Intimate Partner Violence ( $N=55$ ) Adulthood Female	1 group	$r=-.23$ between CSE and physical abuse $r=-.53^{**}$ between CSE and PTSD severity CSE mediates relation between cognitive bias in the interpretation of physiological sensations and PTSD
Schultz, Sorensen, & Waaktaar, 2012	War ( $N=81$ ) Adolescence Mixed Gender ( $F=48.1\%$ )	1 group	$r=.25^*$ between self-efficacy and trauma exposure
Taylor, Absolom, Snowden, & Eiser, 2012	Childhood Cancer ( $N=108$ ) Early Adulthood Mixed Gender ( $F=52.8\%$ )	1 group	$r=-.49^{**}$ between self-efficacy and PSS $\Delta R^2=.29^{***}$ PSS predict self-efficacy
Caldwell, Shaver, Li, & Minzenberg, 2011	Childhood Trauma ( $N=76$ ) Early Adulthood Female	1 group	$r=-.32^{**}$ between parental self-efficacy and childhood maltreatment; $r=-.28^*$ between self-efficacy and emotional abuse; $r=-.23^*$ between self-efficacy and physical abuse; $r=-.21$ between self-efficacy and physical neglect; $r=-.25^{**}$ between self-efficacy and emotional neglect; $r=-.09$ between self-efficacy and sexual abuse $R^2=.32^{**}$ maternal depression predicts parental self-efficacy

Note. CSE=Coping Self-Efficacy; PSS=Posttraumatic Stress Symptoms; Gender F=Female; Childhood/Adolescence=0-21years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years);  $*p<.05$ ,  $**p<.01$ ,  $***p<.001$ .

### 1.3.3.2 Locus of control

Three studies examined the relationship between locus of control and trauma symptoms with the result of weak to moderate positive associations between locus of control externality and traumatic stress.



**Table 3.** *Locus of control: cross-sectional findings (supplementary to paper 1)*

Authors	Sample	Design	Main Finding
Papanikolaou et al., 2013	Physical Trauma (N=240) Adulthood Mixed Gender (F=44.6%)	2 groups (Trauma caused during political demonstration vs. Trauma caused from other causes)	$r=.47^{**}$ between external LOC and psychological distress in trauma during political demonstration No difference in LOC between groups
Asberg & Renk, 2012	Prison Inmates (N=39) Early Adulthood Female	2 groups (childhood sexual abuse vs. no history of childhood sexual abuse)	$r=.16$ between external LOC and trauma symptoms External LOC does not predict trauma symptoms No difference in external LOC between groups
Zhang, Jiang, Ho, & Wu, 2011	Natural Disaster (N=1976) Adolescence Mixed Gender (F=54.3%)	1 group	$r=-.12^{***}$ between LOC internality and traumatic stress $r=.35^{***}$ between LOC power of others and traumatic stress $r=-.38^{***}$ between LOC chance and traumatic stress Higher power others locus of control in boys vs. girls

Note. LOC=Locus of Control; Gender F=Female; Childhood/Adolescence=0-21years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years); \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

### 1.3.3.3 Self-esteem

A closer look into the research on self-esteem provides a coherent picture in that self-esteem and exposure to or symptoms from traumatic experiences are connected in a negative manner. The positive association between self-esteem and the various childhood traumatic experiences in the study of Kapeleris and Paivio (2011) results from the instrument assessing self-esteem, with higher scores referring to greater self-esteem problems. Two studies (Chen et al., 2012; Yen et al., 2013) found evidence for the mediating function of self-esteem in the relationship between exposure to traumatic events and various trauma sequelae. Furthermore, Matsuura et al. (2013) tested the causal relationship between adverse childhood experiences and self-esteem, applying a structural equation model. High levels of childhood adversity, aggressiveness, and depressive symptoms were found to negatively predict adult self-esteem.

**Table 4.** *Self-esteem: cross-sectional findings (supplementary to paper 1)*

Authors	Sample	Design	Main Finding
Matsuura, Hashimoto, & Toichi, 2013	Adverse Childhood Experiences ( $N=366$ ) Adolescence Female	2 groups (Adverse Childhood Experiences vs. Controls)	$r=-.24^{**}$ between self-esteem and adverse childhood experiences $R^2=.25$ adverse childhood experiences, aggressiveness and depressive symptoms predict self-esteem
Yen, Yang, Wu, & Cheng, 2013	Various Potentially Traumatic Events ( $N=5607$ ) Adolescence Mixed Gender ( $F=52.7\%$ )	1 group	Significant association between domestic violence and self-esteem Self-esteem mediates relation between family adversity and social anxiety
Asberg & Renk, 2012	Prison Inmates ( $N=39$ ) Early Adulthood Female	2 groups (childhood sexual abuse vs. no history of childhood sexual abuse)	$r=-.63^{**}$ between self-esteem and trauma symptoms No differences in self-esteem between groups
Brodski & Hutz, 2012	Childhood Trauma ( $N=293$ ) Early Adulthood Mixed Gender ( $F=65.4\%$ )	1 group	$r=-.44^*$ between self-esteem and emotional abuse Lower self-esteem in individuals with exposure to violence vs. no exposure to violence
Chen, Wang, Zhang, & Shi, 2012	Natural disaster ( $N=156$ ) Childhood Mixed Gender ( $F=49.4\%$ )	1 group	$r=-.19^*$ between self-esteem and trauma exposure Self-esteem mediates relation between trauma exposure and posttraumatic stress symptoms
Fergusson, McLeod, & Horwood, 2013	Childhood Sexual Abuse ( $N=987$ ) Early Adulthood Mixed Gender ( $F=51.6\%$ )	1 group Assessment exposure to childhood sexual abuse (<16) at ages 18 and 21 Assessment self-esteem at age 30	$\beta=-0.371$ , $SE=0.181$ , $p=.041$ between childhood sexual abuse and self-esteem
Jiménez Ambriz, Izal, & Montorio, 2012	Stressful Life Events ( $N=325$ ) Adulthood Mixed Gender ( $F=65\%$ )	1 group	$r=-.15^{**}$ between self-esteem and stressful events
Soler, Paretilla, Kirchner, & Forns, 2012	Various Kinds of Victimization ( $N=722$ ) Adolescence Mixed Gender ( $F=64\%$ )	1 group	Lower self-esteem in girls vs. boys No difference in self-esteem between victims vs. non-victims Poly-victimized individuals (nine different kinds of victimization) report lower self-esteem than individuals with less or no victimization
Wondie, Zemene, Reschke, & Schröder, 2012	Childhood Sexual Abuse ( $N=318$ ) Adolescence Female	1 group	$r=-.22^{**}$ between negative self-worth and intrusions; $r=.09$ between negative self-worth and avoidance; $r=-.28^{**}$ between negative self-worth and hyperarousal; $r=-.12^*$ between positive self-worth and intrusions; $r=.11^*$ between positive self-worth and avoidance; $r=-.14^*$ between positive self-worth and hyperarousal

**Table 4. (continued)**

Authors	Sample	Design	Main Finding
Kapeleris & Paivio, 2011	Childhood Trauma ( $N=187$ ) Early Adulthood Mixed Gender ( $F=74.3\%$ )	1 group	$r=.25^{**}$ between self-esteem and emotional abuse; $r=.27^{**}$ between self-esteem and emotional neglect; $r=.16^*$ between self-esteem and physical abuse; $r=.18^{**}$ between self-esteem and physical neglect; $r=-.05$ between self-esteem and sexual abuse
Robinaugh & McNally, 2011	Childhood Sexual Abuse ( $N=102$ ) Middle Adulthood Female	1 group	$r=-.47^{***}$ between self-esteem and posttraumatic stress symptoms Self-esteem does not predict posttraumatic stress symptoms

Note. <sup>1</sup>=Trauma type not specified; Gender F=Female; Childhood/Adolescence=0-21 years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years); \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

### 1.3.3.4 Self-control/Impulsivity

The results concerning the relationship between impulsivity and outcomes following traumatic experiences are consistent across studies (Table 5). Weak to strong associations suggest that more severe traumatic distress is accompanied by a higher impulsivity level and vice versa. Furthermore, three studies (Evren et al., 2013; Li et al., 2012; Somer et al., 2012) examined the mediating or moderating effects of impulsivity on the relationship between trauma exposure and various psychological outcomes following trauma.

**Table 5. Impulsivity: cross-sectional findings (supplementary to paper 1)**

Authors	Sample	Design	Main Finding
Carli et al., 2014	Childhood Trauma ( $N=1356$ ) Early Adulthood Male	1 group	$r=.09^{**}$ between IMP and childhood trauma Sexual abuse, physical neglect, psychological resilience and presence of substance use disorders predict IMP
Evren et al., 2013	Childhood Trauma ( $N=200$ ) Adulthood Male	1 group	$r=.34^*$ between IMP and childhood trauma IMP mediates association between childhood trauma and dissociation
Netto et al., 2013	Various Potentially Traumatic Events ( $N=2213$ ) Early Adulthood Mixed Gender ( $F=66.1\%$ )	1 group	Higher IMP in individuals with PTSD vs. no PTSD
Swick, Honzel, Larsen, & Ashley, 2013	Combat Veterans ( $N=79$ ) Early Adulthood Mixed Gender ( $F=3.8\%$ )	4 groups (Veterans with PTSD vs. healthy Controls)	$r=.77^{***}$ between attentional IMP and PTSD Higher IMP in individuals with PTSD vs. no PTSD

**Table 5. (continued)**

Authors	Sample	Design	Main Finding
Li, et al., 2012	Childhood Trauma ( $N=450$ ) Early Adulthood Mixed Gender ( $F=55.1\%$ )	1 group	$r=.12^*$ between IMP and childhood trauma IMP mediates association between childhood trauma and age of onset of drug use
Mair, Cunradi, & Todd, 2012	Adverse Childhood Experiences ( $N=1861$ couples) Adulthood Mixed Gender	1 group	Male: $r=.10^*$ between IMP and adverse childhood experiences Female: $r=.14^{**}$ between IMP and adverse childhood experiences Male: IMP mediates association between adverse childhood experiences and intimate partner violence
Somer, Ginzburg, & Kramer, 2012	Childhood Trauma ( $N=81$ ) Adulthood Mixed Gender ( $F=41\%$ )	1 group	$r=.26^*$ between IMP and physical neglect; $r=.31^{**}$ between IMP and physical abuse; $r=.43^{***}$ between IMP and emotional neglect; $r=.44^{***}$ between IMP and emotional abuse; $r=.33^{**}$ between IMP and sexual abuse IMP does not moderate the association between childhood trauma and dissociative psychopathology IMP mediates the association between childhood trauma and dissociation
Weiss et al., 2012	Various Potentially Traumatic Events ( $N=180$ ) Adulthood Mixed Gender ( $F=67.8\%$ )	1 group	$r=.37^{**}$ between difficulties controlling impulsive behaviors and posttraumatic stress symptoms Higher IMP in individuals with probable PTSD vs. no traumatic exposure and vs. traumatic exposure but no PTSD

*Note.* IMP=Impulsivity; Gender F=Female; Childhood/Adolescence=0-21 years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years).

### 1.3.3.5 Conscientiousness

A mixed pattern emerges with regard to the relationship between conscientiousness and trauma sequelae (Table 6). Together, the findings portend a rather minor linkage between conscientiousness and distress following trauma. In two studies (Caska & Renshaw, 2013; Gallardo-Pujol & Pereda, 2013), conscientiousness has been included as a moderator in the analysis.

**Table 6.** *Conscientiousness: cross-sectional findings (supplementary to paper 2)*

Authors	Sample	Design	Main Finding
Caska & Renshaw, 2013	National Guard/Reserve Service Members ( $N=214$ ) Adulthood Mixed Gender ( $F=2.8\%$ )	1 group	$r=-.17^*$ between CON and PTSD CON moderates relation between aftermath of battle experiences and PTSD
Gallardo-Pujol & Pereda, 2013	Child Sexual Victimization ( $N=119$ ) Early Adulthood Mixed Gender ( $F=80\%$ )	1 group	$r=.02$ between CON and sexual victimization $R^2=.59$ neuroticism, CON, sexual victimization and interaction between sexual victimization and CON predict psychopathology CON moderates the association between sexual victimization and psychopathology
McElroy & Hevey, in press	Adverse Child Experiences ( $N=176$ ) Adulthood Mixed Gender ( $F=51.1\%$ )	1 group	$r=.29^{**}$ between CON and number of adverse child experiences $r=.51^{**}$ between CON and well-being
Karanci et al., 2012	Various Potentially Traumatic Events ( $N=969$ ) Adulthood Mixed Gender ( $F=63\%$ )	1 group	$r=.02$ between CON and posttraumatic symptom severity
McFarlane et al., 2005	Early Life Stress ( $N=740$ ) Childhood/Adulthood Mixed Gender ( $F=50\%$ )	1 group	Lower levels of CON in individuals with early life stress vs. no early life stress
Fauerbach, Lawrence, Schmidt, Munster, & Costa, 2000	Burn Patients ( $N=70$ ) Adulthood Mixed Gender ( $F=21.1\%$ )	1 group	Lower CON level in burn survivors vs. population means

*Note.* CON=Conscientiousness; Gender F=Female; Childhood/Adolescence=0-21 years; Early Adulthood=22-40 years; Middle Adulthood=41-60 years; Adulthood=from Early to Old Adulthood (>60 years); \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

To conclude, in a time interval of two years, quite a large number of studies have been carried out on the relationship between trauma exposure and motivational variables, including only one longitudinal study (Bosmans et al., 2013) and one study treating a motivation-related construct as an outcome variable (Matsuura et al., 2013).

## **2 THE PRESENT WORK**

This chapter offers a short description of the three publications and highlights their key findings. Prior to this summary, the main research questions and goals of each paper are briefly summarized, followed by a short presentation of the study sample.

### **2.1 Aims of the PhD thesis**

This PhD thesis is embedded in the project “Verding- und Heimkinder im Alter” with the overarching research question of how individuals with a history of childhood trauma age. The main goal of this thesis was to explore the association between motivation-related variables and childhood trauma in these participants. More precisely, the following research questions were primarily addressed:

*Paper 1:* What is the current status of empirical findings on the relationship between motivational variables and traumatic stress?

- Which motivation-related constructs have been considered in research on psychotraumatology?
- Have longitudinal studies been conducted and can conclusions be drawn about the direction of the effects?
- Have motivation-related constructs been considered as predictors, mediators, or outcome variables?

*Paper 2:* Is there a relationship between potential traumatic events in childhood and motivational abilities (self-efficacy, conscientiousness, and impulsivity) in late adulthood depending on the developmental stage in which the trauma first took place?

- Can certain aging trends be determined?

- Do motivational abilities in late adulthood differ depending on the developmental stage at first trauma exposure?

*Paper 3:* Is there a relationship between potential traumatic events in childhood and delay discounting in late adulthood?

- Do elderly persons with a history of childhood trauma display higher delay discounting compared to elderly persons without a history of childhood trauma?
- Which variables can explain the largest amount of variance in delay discounting?

## **2.2 Study Sample: Swiss Former Indentured Child Laborers (“Verdingkinder”)**

The results of the present thesis (*papers 2 and 3*) are based on data from a particular population of people in late adulthood with a high prevalence of potentially traumatic events in childhood: “Verdingkinder” or “former indentured child laborers”. Until far into the second half of the 20<sup>th</sup> century, it was very common in Switzerland to place children from destitute families or orphaned children outside of their families of origin (Leuenberger & Seglias, 2008a; 2008b). The authorities very frequently utilized a particularly cruel method by auctioning such children at public markets. These children were typically sent to rural areas to farmers’ or children’s homes to work. Many of them were exploited, physically or sexually maltreated, neglected, and not allowed to attend school. The children had no rights and were completely defenselessly delivered to the foster families. This phenomenon produced an immense number of affected children, which cannot be ascertained but is estimated as being on the scale of hundreds of thousands of children.

More details on recruitment and data collection are provided in *papers 2 and 3*.

## **2.3 Summary of Paper 1: The Overlooked Relationship between Motivational Abilities and Posttraumatic Stress: A Review**

### **2.3.1 Background and objectives**

The first paper, a review article, summarized the literature on the relationship between motivational variables and traumatic stress. Experiencing traumatic events very frequently seriously negatively impacts the mental health of a person, including his or her motivational abilities. The term motivation involves processes that are crucial for goal directed behavior (Bargh, Gollwitzer, & Oettingen, 2010), which is essential for successfully managing life (Brunstein et al., 1999). According to theoretical assumptions, the main hypothesis of the review article was that traumatic stress should lead to motivational deficits. Because core concepts from motivation psychology are missing in trauma research, motivational aspects of self-evaluation were considered (Judge et al., 2002). The review investigated the roles of self-efficacy (Bandura, 1997), locus of control (Rotter, 1966), self-esteem (Fleming & Watts, 1980), and impulsivity/self-control (Hofmann et al., 2009) in the context of trauma. Furthermore, whether longitudinal studies had been conducted and whether gender-related effects were evident was examined.

### **2.3.2 Methods**

The review analyzed studies published in peer-reviewed journals prior to August 2011. The search resulted in a large number of studies, the abstracts of which were scanned according to the following exclusion criteria: non-English language, therapeutic intervention studies, studies on resilience or medical concerns and studies not testing the association between traumatic stress/PTSD and motivational variables. Lastly, 54 studies were included and analyzed in *paper 1*.



### 2.3.3 Results

One-fifth of the studies were longitudinal, with the great majority dealing with self-esteem. Approximately 54% of the studies were conducted on samples with young adults, and only two studies used samples of older individuals. Man-made trauma, i.e., child abuse, was predominant, followed by war-related traumatic experiences and natural disasters. Longitudinal studies found a moderate to strong negative association between self-efficacy and PTSD. Furthermore, the results revealed that self-efficacy was a robust predictor of traumatic stress in adulthood and may mediate the relationship between acute stress/baseline PTSD and subsequent PTSD. Cross-sectional findings showed the strongest relationship between traumatic stress and self-efficacy, followed by self-esteem and locus of control with similar strengths of association. Rather contradictory results were found regarding impulsivity. Gender-related differences had been investigated in only a few studies resulting in ambiguous findings.

### 2.3.4 Discussion and conclusion

In summary, the results of *paper 1* are in accordance with previous research investigating the relationship between self-efficacy and traumatic stress (Luszczynska et al., 2009). Surprisingly, the association between locus of control and posttraumatic stress was weak to moderate or even absent. This might be due to self-blame (Davis, Lehman, Silver, Wortman, & Ellard, 1996) or counterfactual thinking (Leithy, Brown, & Robbins, 2006), which may mediate or moderate the association between locus of control and traumatic stress. The weak association between self-esteem and posttraumatic stress might be explained by the measure of self-esteem. While present research has focused on the level of self-esteem in traumatized groups, it might be more informative to emphasize the goals individuals pursue to achieve self-esteem (Crocker & Park, 2004). The inconsistent findings regarding impulsivity in

trauma victims may be found in the confounding factors that are very frequently present in these studies, such as comorbid disorders, including substance abuse or borderline personality disorder (Marshall-Berenz, Vujanovic, & MacPherson, 2011). However, due to a lack of research, the question of whether traumatic stress affects motivational abilities remains open. Longitudinal studies, studies with motivation-related constructs as outcome variables, and studies with older individuals are necessary to address the challenges noted in the existing literature.

## **2.4 Summary of Paper 2: Trauma, Developmental Stages, and Motivational Abilities in Swiss Indentured Child Laborers in Old Age**

### **2.4.1 Background and objectives**

In *paper 2*, the relationship between potential traumatic events in childhood and motivational variables (self-efficacy, conscientiousness, and impulsivity) in late adulthood were examined in terms of developmental stage. There is evidence in the literature that aversive childhood experiences continue to have a negative impact on psychological well-being decades later (Rusby & Tasker, 2009). Furthermore, research has shown that adopting the developmental perspective in a trauma context is a promising approach (Maercker et al., 2004; Pynoos, Steinberg, & Piacentini, 1999). In *paper 2*, depending on the age when first indentured, the sample was divided into four groups: infancy (0-2 years), preschool (3-5 years), early childhood (6-9 years), and early adolescence ( $\geq 10$  years). The main goal was to explore whether certain age trends were recognizable concerning the relationship between potentially traumatic events in childhood and motivational variables seven decades later. Furthermore, the study aimed to investigate whether there was a difference in motivational abilities in adulthood depending on the developmental stage when the potentially traumatic events began.

#### 2.4.2 Methods

Overall, 114 participants (38.6% female) with a mean age of 77.6 years ( $SD=7.0$ ) were divided into four subgroups according to age when first indentured: infancy ( $n=32$ ), preschool ( $n=25$ ), early childhood ( $n=29$ ), and early adolescence ( $n=28$ ). Potentially traumatic events were assessed using the German version of the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003; German version by Gast, Rodenwald, Benecke, & Driessen, 2001). The General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995), the German short version (Koerner et al., 2008) of the conscientiousness subscale of the NEO Five Factor Inventory (McCrae & Costa, 2004), and the short version (Spinella, 2007) of the Barratt Impulsiveness Scale (BIS; Patton et al., 1995) were administered to assess motivational variables.

#### 2.4.3 Results

Descriptive data analysis revealed the strongest negative association in the early adolescence group between self-efficacy and CTQ, followed by the negative relationship between conscientiousness and CTQ. The highest positive correlation between impulsivity and CTQ was found in preschoolers. The results of the regression analysis showed that gender, CTQ, and the age group comparison between preschoolers and early adolescence explained 14% of the variance in self-efficacy. That is, individuals indentured during the preschool seem to display lower levels of self-efficacy in late adulthood. However, this result was only marginally significant.

#### 2.4.4 Discussion and conclusion

To sum up, there seems to be no difference in motivational abilities in the elderly with childhood adversities depending on the age when first indentured. A more in depth analysis revealed a significant negative relationship between potentially traumatic events and self-

efficacy as well as conscientiousness in individuals indentured in early adolescence ( $>10$  years). Previous research suggests a different processing of traumatic events in children ( $\leq 12$  years) and adolescents (Maercker et al., 2004). This may also be true with regard to motivational abilities. Contrariwise, self-control (or impulsivity) seems to be affected by the deleterious effect of trauma or adversity already at an earlier age.

## **2.5 Summary of Paper 3: Does Trauma Impair Self-Control? Differences in Delay Discounting in Former Indentured Child Laborers and Non-Traumatized Controls**

### **2.5.1 Background and objectives**

Individuals exert self-control by delaying gratification to pursue and achieve certain goals (Baumeister & Tierney, 2011). Current research is still lacking evidence for the relationship between traumatic stress and delay discounting--the tendency to choose immediate but smaller rewards instead of later larger rewards (Reynolds, 2006)--as a facet of self-control (Simmen-Janevska, Brandstätter, & Maercker, 2012). In *paper 3*, the relationship between childhood trauma and delay discounting in later life was examined. Based on previous findings, the hypothesis was that elderly persons with physical or sexual abuse in childhood would display higher levels of delay discounting (i.e., lower self-control) compared to individuals with no such experiences in their life history (Henschel, de Bruin, & Moehler, 2013). In addition, potential predictors of delay discounting, such as sociodemographic characteristics, history of abuse, depressive symptoms, and motivational factors (self-efficacy, conscientiousness), were explored.

### 2.5.2 Methods

Overall, 153 subjects with a mean age of 76.2 years were included in the control group design. Swiss former indentured child laborers ( $N=103$ ) with a history of abuse during their childhood were compared to controls ( $N=50$ ) with no such experiences. The data for the control group originated from a previous gerontological project (Forstmeier et al., 2011). Delay discounting was assessed using the Swiss-German version of the Delay Discounting Test (DDT; Forstmeier & Maercker, 2011). To measure childhood adversities, the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) was used in the trauma exposure group and the Adverse Childhood Experiences Questionnaire (ACE; Felitti et al., 1998) in the control group. Other instruments used included the General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995), the German short version (Koerner et al., 2008) of the conscientiousness subscale of the NEO Five Factor Inventory (McCrae & Costa, 2004), and the Geriatric Depression Scale (GDS; Sheikh & Yesavage, 1986).

### 2.5.3 Results

The results confirmed the hypothesis that former indentured child laborers showed significantly higher delay discounting (or lower self-control) in all modalities than the control subjects. Moreover, a hierarchical multiple regression analysis revealed years of education, history of abuse, and self-efficacy as significant predictors of the general delay discounting rate.

### 2.5.4 Discussion and conclusion

The study results confirm existing findings reporting higher delay discounting in individuals with psychopathology than in healthy controls (Heerey, Robinson, McMahon, & Gold, 2007; Lovallo et al., 2013). It can be assumed that trauma exposure or the accumulation of trauma

and additional socioeconomic adversities impaired the development of self-control abilities in traumatized individuals, which are still apparent decades later. Impaired cognitive abilities or substance abuse disorders are additional possible explanatory factors for lower self-control. Furthermore, a history of physical or sexual abuse during childhood, self-efficacy, and years of education significantly explained variance in delay discounting and thus may make a significant contribution to decision-making behavior in later life.

### **3 GENERAL DISCUSSION**

The following sections present an overall discussion of this PhD thesis' results. First, the findings are integrated within existing research by considering both the motivation-related constructs and the developmental perspective. After that, concrete transfer possibilities for future research and clinical practice drawn from the knowledge gained in this thesis are outlined. This chapter closes with a general conclusion.

#### **3.1 Integration of Findings**

The integration of findings focuses on current research by debating aspects that have not yet been subject to discussion in the three papers. Ideas already presented in the thesis' papers will not be addressed again here. Furthermore, the new literature on the relationship between potentially traumatic events and conscientiousness will only be discussed in section 3.1.2 (childhood trauma and conscientiousness).

##### **3.1.1 Current state of research**

The leading question of reviewing the literature was to investigate whether research on traumatic stress has focused on motivation-related variables, especially whether these variables have been treated as outcomes in the aftermath of traumatic exposure.

Overall, a similar pattern of findings was observed in the new studies as reported in the preceding literature review (*paper I*). Only one longitudinal study on the relationship between self-efficacy and post-traumatic stress was found but with the methodological weakness of having investigated self-efficacy only at the latest measurement point in time (Bosmans et al., 2013). In the remaining cross-sectional studies, on the one hand, the negative association between self-efficacy/internal locus of control/self-esteem and traumatic stress symptoms was largely confirmed. On the other hand, a positive association between

impulsivity/external locus of control and symptoms of traumatic distress became evident. In contrast to the ambiguous results with regard to impulsivity and traumatic stress in *paper 1*, the new findings present a more coherent picture. That is, individuals with an increased level of traumatic distress display higher impulsivity. Furthermore, self-esteem and impulsivity were first investigated in participants with childhood trauma, primarily man-made trauma. In contrast, self-efficacy and locus of control focused predominantly on traumatic events that occurred in adulthood, considering both collective and individual trauma.

Interestingly, it is striking that compared to the three other constructs, self-esteem has more frequently been subject to discussion in younger populations (*paper 1*) and in populations with childhood traumatic experiences. One reason for that could be that self-esteem is understood as a specific human need (Grawe, 2007) that has traditionally been placed at the top of all human needs (Brown, 1993; McDougall, 1923). Therefore, it seems comprehensible to strive to fully understand how traumatic events impact this need from the very beginning. Another explanation is that the other three constructs, namely self-efficacy, locus of control, and self-control/impulsivity, all include aspects of controllability, and compared to self-esteem the available research on them is newer.

To conclude, complementary to the literature review in *paper 1*, a supplementary search was undertaken, producing 32 studies that analyzed the relationship between the motivation-related variables self-efficacy, locus of control, self-esteem, and impulsivity and a history of exposure to traumatic events. Several issues still remain: (1) the need for longitudinal research, (2) the need to explore the impact of trauma on motivation-related variables, and (3) the need to investigate these effects in individuals in old adulthood.



### 3.1.2 Impact of childhood trauma on adult individual motivational aspects

#### *Childhood trauma and self-efficacy*

The main question was whether there would be a negative relationship between childhood trauma and adult self-efficacy. In agreement with previous findings reported in *paper 1* and section 1.3.3.1, *paper 2* confirmed the negative association between potentially traumatic events in childhood and self-efficacy in old adulthood. It should be noted that only three studies have examined the association between childhood trauma and later self-efficacy, with no study conducted in a sample with older adults (Caldwell et al., 2011; Cieslak, Benight, & Caden Lehman, 2008; Taylor et al., 2012).

In contrast, the results contradict those of studies that either found no relationship between self-efficacy and post-traumatic stress symptoms (Barry et al., 2012) or a positive relationship between self-efficacy and trauma severity (Ferren, 1999; Schultz et al., 2012). These studies were all conducted in samples with young individuals (adolescence and early adulthood). The unexpected results have been explained by the presence of resilience or posttraumatic growth in these individuals. Furthermore, in the study by Barry et al. (2012), a domain-specific measure of self-efficacy, namely educational self-efficacy, was applied. Following this study, the literature has stressed the importance of using a context-specific conceptualization of self-efficacy, as it might be high in one domain, such as health-related behavior, and low in another, such as dealing with partnership conflicts (Gist & Mitchell, 1992; Lambert et al., 2012). However, it is questionable whether a domain-specific conceptualization of self-efficacy for this particular group of former indentured child laborers would have been more suitable. Most of these individuals are required to adjust to a variety of potentially traumatic events, and accordingly, it seems more appropriate to measure the global sense of self-efficacy.

The finding that individuals with severe childhood trauma report a lower level of self-efficacy in old age can also be discussed within the framework of social cognitive theory (Benight & Bandura, 2004). Although the theory has been primarily applied to explain human adaptation following trauma, its core element, self-efficacy, is a result of the interaction between the individual and the environment (Bandura, 1997). Four sources for its development have been described: personal mastery experiences, vicarious experience, verbal persuasion, and emotional arousal. Based on this, it can be assumed that former indentured child laborers who have been exposed to traumatic events on a large scale have been confronted with failures, bad role models, verbal insults of being worthless, and constant stress and anxiety. All of these experiences are prerequisites for developing a low sense of self-efficacy. Given the cross-sectional nature of the present PhD thesis, this assumption is still subject to clarification. In this context, interesting results emerged in one study that compared self-efficacy in experienced firefighters and new recruits, demonstrating lower levels of self-efficacy in long-standing professionals than new employees (Regehr, Hill, Knott, & Sault, 2003). According to the authors, a rationale for this confusing finding might be either that working in an environment with a high probability of frequently experiencing potentially traumatic events decreases self-efficacy, or that new recruits view themselves as self-effective due to their higher education.

Despite the fact that self-efficacy is one of the most extensively examined psychological concepts in the field of aging (Kempen et al., 2005; Vahia, Chattillion, Kavirajan, & Depp, 2011) and that findings outside clinical psychology strengthen the notion that even in samples with very old individuals, self-referent beliefs (e.g., self-efficacy or perceived control) strongly predict well-being (Jopp & Rott, 2006), research on the association between self-efficacy and trauma exposure in old individuals is still rare.

### *Childhood trauma and self-control*

The main assumption was that individuals with a traumatic experience in their early life would report lower levels of self-control (or higher impulsivity) in old adulthood. In this PhD thesis, various aspects of self-control (*paper 2*: impulsivity; *paper 3*: delay discounting) were related to potentially traumatic events in early life. In *paper 2*, a positive association between childhood trauma and impulsivity was found. In *paper 3*, former indentured child laborers reported significantly higher delay discounting rates compared to controls, and as expected, a history of abuse, self-efficacy, and years of education were significantly related to delay discounting.

The finding that individuals with higher childhood trauma scores behave more impulsively later in life is consistent with existing research (Carli et al., 2014; Evren et al., 2013; Ledgerwood & Petry, 2006; Li et al., 2012; Mair et al., 2012; Moehler et al., 2009; Roy, 2005; Somer et al., 2012; Zlotnick et al., 1997). Based on the correlational nature of the findings, no information about causality can be obtained. Nevertheless, given the occurrence of traumatic exposure very early in life, it can be speculated that the trauma might have had an impairing effect on later self-regulatory capabilities because it occurred before their development. *Paper 3* tried to set a further milestone in the clarification of this relationship by using a control group design and found that older adults with traumatic exposure in early life showed lower self-control than their non-traumatized matched opponents.

With regard to delay discounting, no previous study is available that investigates the same relationship as *paper 3*. In addition to the already discussed points in *paper 3*, consulting the literature on ego depletion provides further possible reasons for lower self-control in the trauma exposure group. For example, experimental investigations have shown that individuals' self-regulatory abilities deteriorate in conjunction with being rejected by or excluded from a group (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Having been massively emotionally

abused and neglected (see *paper 3*), former indentured child laborers have suffered rejection and isolation in a naturalistic setting. This childhood experience may reflect their presently lowered impulse control. Theoretically, it is also possible that trauma survivors spend and exhaust their resources in coping with the consequences of trauma and reach a state of ego depletion (Baumeister, 2002). Not only does the initial mobilization of self-control reduce self-control afterwards, but it also increases approach motivation or the impulse to behave (Schmeichel, Harmon-Jones, & Harmon-Jones, 2010). In combination with the possibility that trauma exhausts resources, these findings might provide an explanation for why the prior usage of self-control leads to subsequent disadvantageous behaviors, such as aggression and alcohol consumption, or the inability to delay gratification, as shown in *paper 3*. Another interesting chain of arguments provide results from an experimental study that investigated the effect of response exaggeration (opposite of suppression) on ego depletion (Schmeichel, Demaree, Robinson, & Pu, 2006). Participants were assigned to two groups (exaggerated condition vs. control), were exposed to a film inducing feelings of disgust, and were subsequently required to complete two cognitive tasks. Those who exaggerated their reactions to the film performed worse on the dependent tasks than the controls, who were instructed to behave naturally. These findings support the ego depletion hypothesis, which states that after the depletion of the self-regulatory strength, further self-control abilities are diminished. The authors discussed the clinical implications for this finding, emphasizing the fact that performance on tasks (e.g., neuropsychological tests) being solved after clinical interviews may be influenced by the ego depletion effect. Although the procedure in *paper 3* was not designed to experimentally test ego depletion, an ego depletion effect may have been accidentally induced. In more detail, the interview in the group of former indentured child laborers was conceptualized such that participants first gave an extensive overview about their traumatic experiences in childhood, followed by various other questionnaires, and ultimately

completing the Delay Discounting Test (Forstmeier & Maercker, 2011). Even if the first part of the interview could not be compared to the exaggerated condition as applied by Schmeichel et al. (2006), most of the participants were emotionally involved while speaking about their past. This effort might have depleted their energy state, resulting in a diminished level of self-control compared to the control group participants, who were not asked to talk about early life adversities.

However, to quote Walter Mischel, “whether one should or should not delay gratification or ‘exercise the will’ in any particular choice is often anything but self-evident” (Mischel, 1996, p. 198). Depending on a specific situation, it may or may not be a smart decision to postpone gratification (Shoda, Mischel, & Peake, 1990).

#### *Childhood trauma and conscientiousness*

The orienting research question was whether there was a significant association between potentially traumatic events in childhood and conscientiousness in adulthood, with the assumption that this association might be negative. The relationship between childhood trauma and conscientiousness was investigated in *paper 2*, revealing no significant correlation between the two variables. In a way, this result fits well with the existing literature, which has so far generated inconsistent findings.

On one hand, several studies present similar findings, as reported in *paper 2*. For example, it has been shown that there was no significant relationship between childhood sexual abuse and adult conscientiousness (Gallardo-Pujol & Pereda, 2013; Talbot, Duberstein, King, Cox, & Giles, 2000), or conscientiousness and post-traumatic stress symptoms (Karanci et al., 2012; Knezevic, Opacic, Savic, & Priebe, 2005; Lawrence & Fauerbach, 2003). On the other hand, conscientiousness seems to be positively related to adverse childhood experiences (McElroy & Hevey, in press) and negatively to post-traumatic stress symptoms (Caska &

Renshaw, 2013). Furthermore, in a study with participants with a history of childhood sexual abuse, conscientiousness was strongly positively related to satisfaction with life (Whitelock, Lamb, & Rentfrow, 2013). The authors conclude that highly conscientious individuals aimed at pursuing higher goals related to a better recovery from trauma, which in turn positively influenced life satisfaction. Moreover, complex trauma exposure in children has frequently been associated with distrust of others and ignoring of rules, which is in disagreement with conscientious behavior (Van der Kolk et al., 2009).

One reason for the inconsistent findings regarding conscientiousness might be rooted in its different definitions used in the literature, such as being a facet of achievement, responsibility, or impulse control (Roberts et al., 2005). In *paper 2*, conscientiousness was composed of characteristics, such as orderliness, planning, or engagement, which, on one hand, are patterns involved in goal oriented behavior, but on the other hand, might not be affected decades later after a traumatic event (Körner et al., 2008). However, a closer look at the results in *paper 3* reveals that former indentured child laborers report lower levels of conscientiousness compared to controls without a history of trauma. Therefore, further research is needed to shed more light on this association in older adults with early trauma.

In sum, the vast majority of former indentured child laborers have been exposed to long-lasting interpersonal violence and maltreatment. The literature on developmental trauma suggests that these children demonstrate unique characteristics compared to children with single instances of trauma (Van der Kolk et al., 2009). More concretely, they seem to have more difficulties with completing tasks, planning, or goal-directed behavior, which represent abilities that involve motivational processes as well. This raises the question of whether these difficulties persist over time. As an illustration, one additional finding from *paper 3* suggests that the divorce rate in former indentured child laborers was significantly higher than in the control group. This finding might refer to the “sense of a foreshortened future” that some

trauma survivors experience. More precisely, these individuals might lack the ability to provide a commitment to their partners to pursue common goals and plan together for their future, which is essential for a long-term relationship.

Furthermore, according to Bandura (1993), a large part of human motivation is a product of cognitive processes. In the literature, variables such as locus of control, self-esteem, and self-regulation have been regarded as relevant cognitive factors in the adaptation process following childhood adversity (Collishaw et al., 2007). To demonstrate this concept based on coping theory (Lazarus & Folkman, 1984), Qouta, Punamäki, Montgomery and Sarraj (2007) aimed to discover the factors that predict mental health in adolescents with childhood trauma. According to the theory, trauma survivors first appraise the meaning and severity of the trauma and then apply the most suitable coping strategies to manage it. The authors discovered that individuals with low cognitive capacity (concentration, attention, memory organization) and an increased level of neuroticism were most affected by PTSD. Given the indication that potentially traumatic events may impair cognitive functioning, it might be possible that cognitive variables moderate the relationship between childhood trauma and motivational abilities later in life in the present sample (Burri et al., 2013).

### 3.1.3 Importance of a developmental perspective

While some research has addressed the appearance of psychopathology later in life, depending on the developmental stage when the traumatic event occurred (Gregorowski & Seedat, 2013; Maercker et al., 2004; Pesonen et al., 2007; Yehuda et al., 1997), to the best of my knowledge, nothing is known about how trauma that takes place in different stages of early development shapes motivational processes later in life. *Paper 2* tried to fill this gap in the literature by exploring the still unknown relationship between early trauma and adult motivation based on a developmental perspective. Preliminary analyses suggest that there is a

significant relationship between potentially traumatic events in early life and self-efficacy/conscientiousness later in life, when the trauma occurred after the age of 10 years. On the contrary, the most significant connection between potentially traumatic events and impulsivity/self-control emerged for those whose first trauma took place between the ages of three and five years.

In conformity with the hypothesis, in former indentured child laborers who were first separated from their families of origin (and were highly likely then confronted with their first traumatic event) after the age of 10 years, high distress stemming from childhood trauma was linked to lower levels of self-efficacy and conscientiousness. As this finding cannot directly be compared with former studies because of their absence, the focus will be extended to investigations considering similar research questions. From that angle, a study with Jewish children who were hidden and separated from their parents during the Holocaust found a positive association between the children's age and PTSD, with children who were older at the time of hiding being affected by post-traumatic stress symptoms to a higher extent 65 years later (Fohn, Grynberg, & Luminet, 2012). That was not true for those who were younger than five years at the time of trauma. Furthermore, while age did not directly significantly predict PTSD symptoms, it was significantly related to the sense of danger. The authors argue that older children had a well-established concept of self-awareness and thus have experienced the real threat more consciously. This argument could be applied in the present sample, indicating that the older the children were at the time of the first exposure to trauma (or the first indenture), the more they felt threatened and aware of the consequences of the threat and therefore experienced increased helplessness, which led to a reduced conviction in their own capabilities (self-efficacy) and a diminished sense that actions can be planned or impulses controlled (conscientiousness). Another recently published study evaluated the long-term influence of traumatic stress on psychological functioning in old age in dependence of



the developmental stage when the traumatic event took place (Ogle, Rubin, & Siegler, 2013). In particular, five sub-groups were formed from a large, nonclinical sample: childhood (3-12 years), adolescence (13-19 years), young adulthood (20-34 years), midlife (35-54 years), and older adulthood ( $\geq 55$  years). Traumatic events that occurred during childhood had the greatest negative impact on traumatic stress symptoms, subjective happiness, social support, and coping capabilities in older adulthood. Because self-efficacy and conscientiousness cover elements of the coping construct (Benight & Bandura, 2004; Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009), the findings of *paper 2* corresponded to those reported by Ogle et al. (2013) as well. However, in the latter study, the authors considered childhood to be a period from 3 to 12 years of age, which contradicts the group separation described in *paper 2*.

In turn, the findings on the relationship between impulsivity and trauma exposure during preschool ages (between 3-5 years) could be incorporated into the research of Keilson (1992) on so-called sequential traumatization, who underlined the developmental perspective and stressed that age at trauma exposure concerns the progression of future impairments, with younger children being at greater risk for long-term damage. In essence, at an early developmental stage, children depend on their primary caregivers, who act as co-regulators (Dozier, Zeanah, & Bernard, 2013). Following earlier findings that preschool is a critical period when the active regulatory control system is formed (Fabes et al., 1999; Rothbart & Bates, 1998), and given that impulsivity is a facet of self-control (Hofmann et al., 2009), the present results showing that those who experience trauma during preschool display lower self-control or higher impulsivity in old age provide further support for this hypothesis. In this case, it also appears to be appropriate that there is no relationship between childhood trauma that occurred after the age of five and adult impulsivity.

Furthermore, along with the literature on the development of the human appraisal system and response to danger (Fabes et al., 1999; Pynoos et al., 1999) on the one hand, and the fact that traumatic stressors are perceived as uncontrollable (Foa, Zinbarg, & Rothbaum, 1992) on the other hand, the results of *paper 2* became plausibly explainable. Put another way, older children have a better-established appraisal and cognitive system, which is affected by traumatic events more seriously because of their uncontrollability, thus leading to a greater impairment in motivational processes. Younger children, however, seem to maintain a sort of protection due to their immature appraisal system, which is responsible for a less serious effect on self-efficacy and conscientiousness after trauma.

### **3.2 Knowledge Gain: Implications for Research and Clinical Practice**

#### **3.2.1 Implications for future research**

Building on the findings discussed in the previous sections and the knowledge gained from this PhD thesis, the following paragraphs contain some suggestions that shall stimulate future research in this area. Furthermore, limitations that have not yet been subject to discussion in the single papers will be addressed in the following section.

First, more theory-based research is needed. A large amount of work on adjustment following trauma has been conducted without reference to any theoretical framework, which prompted some scholars to plead for an increased application of theory-driven research (Benight, 2012). Future research on motivation-related factors in psychotraumatology would benefit from a sound theoretical basis by adopting a well-established conceptualization from the realm of motivation psychology. Here, the personality system interactions (PSI) theory offers a conceivable possibility because the interplay of cognitive and affective functional systems is at its core (Kuhl, 2000a, 2001). Depending on the characteristics of the affect (positive or negative), both flexible or inflexible cognitions and self-regulation can emerge.

More precisely, PSI theory distinguishes four cognitive macrosystems, such as intention memory (representation of intentions), extension memory (e.g., implicit motives, needs, and expectations), intuitive behavior control (automatic behavior programs), and object recognition (representations of objects and events), whose interaction is modulated by the affect. Two modulation assumptions have been formulated. First, intention memory and intuitive behavior control interact in the way such that the first provides goal representations, which are carried out in concrete behavior by the latter. Second, extension memory and object recognition interact in such a way that new events are recognized by the latter and are integrated in the already established network of experiences that have been made by the person. Put simply, a positive affect eases the implementation of an intention, whereas a negative affect blocks intuitive behavior but activates intention memory. Furthermore, a highly negative affect activates object recognition (e.g., focus only on difficulties) and inhibits extension memory (e.g., personal needs and desires become inaccessible). Individual differences in stress management result from personal dispositions of action (high competence in affect regulation) versus state orientation (low competence in affect regulation). PSI theory has been applied in different fields of research (Kuhl, 2000b; Kuhl et al., 2006), however, only sparingly in clinical psychology (Baumann, Kaschel, & Kuhl, 2005). As illustrated in the following examples, its application in research on traumatic stress seems promising. For example, a traumatic experience can be related to a restricted range of affects, such as being unable to have loving feelings. That person will predominantly refer to dysfunctional intentions (e.g., will never find a partner) and will be inhibited to do anything about it. Furthermore, many trauma victims experience highly negative affects (e.g., anxiety), which could have an inhibitive effect on self-access, which in turn can result in an inability to protect their own boundaries. Future studies could investigate the characteristics of action and state orientation in trauma victims and compare them to individuals without a history of trauma.

One further plausible approach in studying goal-oriented behavior in the context of trauma concerns research on goal disengagement. Based on Klinger's (1977) contribution to the research on disengagement from personally meaningful goals with his postulation that goal disengagement represents a process, Brandstätter and Schüler (2013) introduced the concept of action crisis. It is defined as the stage "in which the individual has already invested a great deal into his/her goal. It is the phase of goal striving, when setbacks have accumulated and failures in making progress towards one's goal are becoming highly visible" (Brandstätter & Schüler, 2013, p. 544). Longitudinal studies have provided support for the assumption that an action crisis impairs psychological well-being (Brandstätter, Herrmann, & Schüler, 2013). In a series of experimental studies, the hypothesis that an action crisis would lead to a more intense process of dealing with the cost and benefits of further proceeding with or terminating goal striving has been tested (Brandstätter & Schüler, 2013). For example, in one study, the participants were confronted with the possible scenario of an action crisis, which created the picture of experiencing serious difficulties in a close relationship. Indeed, those in the action crisis condition exhibited more intense thinking about the goal-related costs and benefits. This approach could possibly be applied in research on traumatic stress. In other words, participants without a history of trauma could be put in a state of an action crisis by being confronted with a traumatic scenario (e.g., serious accident) and then asked about costs and benefits of goal striving in different areas of life (e.g., work, relationship). In this way, further insight into motivational processes after a hypothetical traumatic event could first be obtained.

Second, a more advanced methodological approach should be applied. Due to the constantly growing body of literature in the field of motivation-related research in psychotraumatology, the results from the review article (*paper I*) should next be confirmed by conducting a systematic review following prevailing standards (see Higgins & Green, 2008). At the same time, a well-established meta-analytic approach should substantiate the

procedure (e.g., Lipsey & Wilson, 2000). Furthermore, to optimize the methodological approach in exploring the complex relationship between childhood trauma and adult motivation, a partial least squares path analysis technique could be used, as it has recently been applied more and more frequently in gerontological research (Jopp & Rott, 2006). It represents a practical alternative to structural equation modeling with less restrictive requirements, such as small samples or skewed data.

Third, the application of an alternative study design and procedure is possible. As an idea, as it has not yet been investigated in trauma research, it would be interesting to experimentally test the ego depletion effect using a dual-task paradigm similar to the procedure in previous studies (Hagger et al., 2010; Job, Dweck, & Walton, 2010). A possible design would cover a depleting (e.g., “white bear” thought-control task, Wegner, Schneider, Carter, & White, 1987) and a subsequent dependent task (e.g., reverse span memory task). Since referring to this design, counterarguments have been voiced that individuals’ beliefs about the narrowness of willpower might moderate the ego depletion effect, as shown in initial experimental studies, additional instruments should be included that measure those specific beliefs (Job et al., Miller et al., 2012). This approach would reveal whether individuals with an implicit theory that willpower is a limited resource would display decreased self-control after a depleting task.

Fourth, scarcely anything is known about the trajectories of the effects that the traumatic events determine over the course of life, that is, whether they are continuous, rising, remitting, or non-linear (Ogle et al., 2013). Therefore, a longitudinal design is desirable in which motivational variables will be examined at accurately defined points in time to promote more understanding about their relationship with childhood trauma.

Fifth, in *papers 2 and 3*, lifetime traumas or other critical life events were not taken into account as control variables. Because current life stressors have been found to moderate

the association between childhood maltreatment and adult health status (Cromer & Sachs-Ericsson, 2006) and adult survivors of childhood trauma are at higher risk of being repeatedly exposed to traumatic events later in life (Maschi, Baer, Morrissey, & Moreno, 2012), future studies should include these variables in the analysis.

Sixth, it should be investigated whether different types of childhood trauma lead to different outcomes in adult motivation. It is well documented that, for instance, the risk of developing PTSD depends on the type of trauma an individual has experienced (Landolt et al., 2013; Maercker et al., 2004). Given that the sample of former indentured child laborers was a highly burdened sample, with participants having experienced several types of trauma, future research would benefit from the knowledge of which type of trauma particularly impairs motivational processing.

Seventh, a more in-depth analysis should include both self-efficacy and social support. It is possible that they operate bidirectionally: it might be that social support increases self-efficacy and, vice versa, that self-efficacy may be a crucial factor of whether someone seeks social support or not (Schwarzer & Knoll, 2007).

Finally, given that prospective studies constitute an ethical problem in research on psychotraumatology, it could be a way to first investigate motivational processes in professionals working in fields with a high risk of trauma exposure before they are confronted with profession-related traumatic events. Two studies conducted with firefighters have provided the first indication that self-efficacy may suffer from regularly being exposed to potentially traumatic events (Heinrichs et al., 2005; Regehr et al., 2003).

### 3.2.2 Implications for clinical practice

The present PhD thesis is so far one of the few studies that aims to understand how people with potentially traumatic events in early life age and what challenges they face in their lives.

Albeit preliminary, the most important finding with practical relevance was that old people that experienced potentially traumatic events in early childhood showed significant impairments in self-control. Another relevant finding was that exposure to greater childhood adversity is related to lower self-efficacy.

Experiencing potentially traumatic events is a common occurrence in life. One Swiss representative study found that 36% of older adults had experienced at least one potentially traumatic event in their lives (Maercker & Pielmaier, 2010). Working with the elderly, clinicians should bear in mind that challenges linked to growing older (e.g., loss of spouse, retirement, age-related diseases) may reactivate stress in survivors of childhood trauma (Barel et al., 2010). This situation may not primarily result in disorders but can possibly manifest in decreased self-control and self-efficacy and in turn adversely impact individual life and increase psychological strain. Substance use, unhealthy nutrition, pathological gambling (Dennhardt & Murphy, 2011; Melanko & Larkin, 2013; Petry, 2012), or even suicide attempts (Liu, Vassileva, Gonzalez, & Martin, 2012) might be the consequences.

Therefore, strengthening and improving self-control and self-efficacy as important motivational resources for goal striving seem obvious (West, Welch, & Thorn, 2001). For this purpose, a specific cognitive-behavioral therapy would be most appropriate (Gould, Coulson, & Howard, 2012). However, the specific challenges (e.g., deficits in cognitive functioning) that exist in psychotherapeutic work with older people should be considered (Wächtler, 2013). Instead, the view should be broadened to include alternative approaches.

For example, an interesting finding in a sample of young refugees was that the sense of belonging--in this particular case belonging to school--predicted self-efficacy (Kia-Keating & Ellis, 2007). Not only individuals in this particular sample of former indentured child laborers have experienced emotional abuse and rejection but also other populations with childhood adversities reported frequent occurrences of emotional abuse (Pérez et al., 2011).

The sense of belonging is a central human need that can have a protective function in the aftermath of adversity (Masten, 2001) or can conversely be negatively influenced by adversity (Hagerty, Williams, & Oe, 2002). One plausible approach to confront and acknowledge the past traumatic experiences in work with the elderly is to offer life review interventions (Maercker & Forstmeier, 2012). Originally developed in social gerontology, they are based on three principles: life balance (emphasis on positive and negative memories), finding meaning, and elaboration of memory (emphasis on what is remembered). In principle, the therapy's aim is to rewrite the personal life story. A significant number of former indentured child laborers have composed manuscripts or books and have made their stories public (see Leuenberger & Seglias, 2008a). Such a method of processing might help the individual to find his or her own place in the world and positively influence his or her sense of belonging, which consequently might strengthen self-efficacy.

Moreover, many individuals who went through a form of social suffering (e.g., trauma of war, fear of being arrested, no place of refuge) might regard their current lives as meaningless with no relevant contribution to future generations (de Medeiros, Rubinstein, & Ermoshkina, 2013). This situation may also be true for former indentured child laborers. A recent publication debates the right to redress and rehabilitation in trauma survivors and pleads for the involvement of health professionals in the process (Sveaass, 2013). As former indentured child laborers have suffered serious human rights violations and extreme humiliations, the primary emotion they have to cope with might be shame. Therefore, professionals who support and work with this group of individuals should not only consider the individual's life story but also the more global context and historical background to fully understand the psychological strain of these people.

Lastly, the transgenerational perspective should be considered in clinical settings. In concrete terms, parental self-efficacy seems to have an influence on parental competence and



child functioning and should be considered as an underlying mechanism in studying transgenerational processes (Jones & Prinz, 2005). Another study found that contrary to the hypothesis, no significant relationship between parental self-control and child self-control existed (Henschel et al., 2013). However, mothers with a history of physical or sexual abuse had lower levels of self-control and were at a higher risk of abusing their own children. These findings indicate that a well-functioning parental motivational system is essential for caregiving. Based on the results of the PhD thesis, not only older individuals with childhood trauma but also younger trauma survivors would benefit from strengthening their self-efficacy and self-control and in this way improve their caregiving skills.

### **3.3 General Conclusions**

When providing an overview of the present knowledge regarding the association between trauma exposure in childhood and motivational processes in old adulthood, it became obvious that this relationship has not received adequate attention in the literature. This PhD thesis adds to this research, which is still in its infancy, with the overarching aim to explore this association. The thesis' findings suggest--although very preliminarily--that survivors of childhood trauma show lower self-control in their old adulthood than individuals without childhood trauma and that depending on the age at first trauma exposure, a different association between childhood trauma and self-efficacy and childhood trauma and conscientiousness emerges. In those adults who have faced trauma after the age of 10, greater amounts of adversity seem to be related to lower self-efficacy and lower conscientiousness. These correlations appear to be nonsignificant when the trauma occurred at a younger age. In the general discussion, various explanations were provided for these results. Furthermore, concrete recommendations for future research and practice were eventually discussed.

However, above all, this PhD thesis is one of the first to shed light on the dark destiny of Swiss former indentured child laborers. I am very grateful and honored to have had the possibility to meet and talk to people who, despite all of the adversities that they have lived through, they managed to survive, reached old age, and shared their experiences with us.

## **4 PUBLICATIONS**

### **4.1 Paper 1: The Overlooked Relationship between Motivational Abilities and Posttraumatic Stress: A Review**

By Ketí Simmen-Janevska, Veronika Brandstätter, & Andreas Maercker

A similar version of this chapter is published:

Simmen-Janevska, K., Brandstätter, V., & Maercker, A. (2012). The overlooked relationship between motivational abilities and posttraumatic stress: A review. *European Journal of Psychotraumatology*, 3, 18560 - <http://dx.doi.org/10.3402/ejpt.v3i0.18560>.

## **4.2 Paper 2: Trauma, Developmental Stages, and Motivational Abilities in Swiss Indentured Child Laborers in Old Age**

By Keti Simmen-Janevska, Andrea B. Horn, Sandy Krammer, & Andreas Maercker

A similar version of this chapter is published:

Simmen-Janevska, Horn, A. B., Krammer, S. & Maercker, A. (2014). Traumata, Entwicklungsperioden und motivationale Fähigkeiten bei Schweizer Verdingkindern im Alter. *Zeitschrift für Psychosomatische Medizin und Psychotherapie*, 60, 146-161.

### **4.3 Paper 3: Does Trauma Impair Self-Control? Differences in Delay Discounting in Former Indentured Child Laborers and Non-Traumatized Controls**

By Ketí Simmen-Janevska, Simon Forstmeier, Sandy Krammer, & Andras Maercker

A similar version of this chapter is submitted for publication.

#### **Abstract**

Traumatic experiences may affect an individual's ability to exercise self-control, which is an essential characteristic for successfully managing life. As a measure of self-control, we used the delay discounting paradigm--the extent to which a person devalues delayed gratification. The aim of this study was to investigate the relationship between childhood trauma and delay discounting using a control group design with elderly participants whose mean age was 76.2 years. Swiss former indentured child laborers ( $N=103$ ) who had been exposed to trauma during their childhood were compared to non-traumatized controls ( $N=50$ ). The trauma exposure group showed considerably higher preference for immediate smaller rewards than controls indicating lower self-control. A hierarchical regression analysis revealed that a history of abuse, current self-efficacy, and education were significantly associated with delay discounting. Implications for future research are discussed.

Traumatic stress can disturb and upset the normal functioning of a person and break her or his will, thus paving the way for a range of dysfunctional emotions, motivations and behaviors. Willpower, however, is unavoidable in regard to successfully managing everyday life. To pursue and achieve certain goals, individuals exert self-control, which is the ability to postpone proximate rewards by developing a long-term vision for delayed gratification (Baumeister & Tierney, 2011). Resisting short-term temptations and learning to delay gratification in early life results in favorable health-related outcomes for subsequent stages of life (Mischel et al., 2011).

Present research is still limited with regard to the association between traumatic stress and delay discounting as a facet of self-control (Simmen-Janevska et al., 2012). Among other potential mechanisms, however, trauma may lead to a depletion of self-control resources (e.g., by showing pronounced avoidance behavior), which, in turn, are essential for healthy recovery from a trauma. As a consequence, the individual may experience increased delay discounting (Baumeister et al., 1998). Based on this assumption, one longitudinal study observed the relationship between self-control and PTSD in a sample of young adults, hypothesizing that low self-control would predict elevated PTSD symptoms (Walter, Gunstad, & Hobfoll, 2010). Although the findings confirmed the hypothesis, the authors argued that the reverse relationship is conceivable as well. That is, trauma exposure may impair the capability to exercise self-control and hence result in increased PTSD symptoms. A longitudinal study with a sample of children examined the association between cumulative risk exposure (e.g., poverty, exposure to violence) and self-regulation four years later, and found that children with a higher cumulative risk due to poverty or exposure to violence demonstrated a reduced ability to self-regulate behavior, that is a reduced ability to delay gratification, respectively (Evans, Fuller-Rowell, & Doan, 2012). Similar findings were reported in another study with young adults who had been exposed to or subjected to adversities during childhood and

adolescence, thus indicating that experiencing stress may prompt individuals to choose smaller, immediate rewards at the expense of larger delayed rewards (Lovallo et al., 2013). Another study examined self-control in physically and sexually abused women and found that a history of abuse and work status were significant predictors of self-control (Henschel et al., 2013). Furthermore, subjects who had been exposed to trauma reported a reduced ability to exercise self-control than non-traumatized individuals. Nevertheless, few other studies have explored the connection between trauma exposure and self-control/impulsivity, thus resulting in rather contradictory findings. Studies among older adults, however, are completely nonexistent (Simmen-Janevska et al., 2012).

The current investigation uses delay discounting as the study paradigm. Delay discounting--the extent to which a person devalues delayed gratification as the length of the delay increases, that is, the tendency to choose immediate but smaller rewards instead of later larger rewards (Reynolds, 2006)--and delay of gratification--the voluntary rejection of an immediate reward because of a more lucrative future option (Mischel et al., 1989)--are similar concepts and are interpreted as aspects of self-control and impulsivity (Forstmeier et al., 2011). One direction of current theorizing posits that self-control depends on a limited resource that reaches a state of exhaustion when acts of self-control are carried out (Baumeister et al., 2007), particularly if avoidance goals are pursued (Oertig et al., 2013). Higher levels of self-control (or lower levels of impulsivity) are related to a decreased likelihood of psychopathology (Boals, vanDellen, & Banks, 2011; Tangney et al., 2004) and to advantageous health behaviors (Melanko & Larkin, 2013).

Considering psychopathological issues, some research is available that has used the delay discounting paradigm, for example, in the context of alcohol-related problems (Dennhardt & Murphy, 2011), substance abuse disorders (Kirby & Petry, 2004), depression (Dombrovski et al., 2012) and depressive symptoms (Lempert & Pizzagalli, 2010), social

anxiety (Rounds, Beck, & Grant, 2007), pathological gambling (Petry, 2012), and schizophrenia (Ahn et al., 2011). Similarly, the link between stress and dimensions of self-control has been a subject of interest to some degree. One study, for example, reported a positive relationship between the occurrence of stressful life events and risky decision-making in adolescents (Fishbein et al., 2006). Another study found that acute psychosocial stress seems to implicate a higher delay discounting rate (Kimura et al., 2013).

Previous research provides insight into further factors that may have an impact on delay discounting. Among these factors, sociodemographic characteristics (e.g., age, gender, education), affective states, and motivation-related variables have been considered as predictors of discounting rates (Alessi & Petry, 2003; Forstmeier & Maercker, 2011). The association between delay discounting and age seems to be curvilinear, with children and older adults preferring immediate rewards or exhibiting impulsive decision-making behaviors and middle-aged individuals possessing the ability to postpone immediate rewards and display high levels of self-control (Drobetz, Maercker, & Forstmeier, 2012). Furthermore, while delay discounting rate has been found to be negatively related to education (Kirby, Winston, & Santiesteban, 2005), gender differences have been tested in some studies but yielded ambiguous results (de Wit, Flory, Acheson, McCloskey, & Manuck, 2007). With regard to affectivity, the results of a study with adults suggest that there is a relationship between the lack of reactivity to pleasures and a lower delay discounting rate (Lempert & Pizzagalli, 2010). The authors posit that this finding can be explained by the decreased responsiveness to immediate rewards in those individuals, and they stress the necessity to consider affective components when examining delay discounting in clinical samples as the direction of the relationship between the two constructs has not yet been clarified. Moreover, motivation-related factors may contribute to forecast delay discounting. While self-efficacy (Bandura, 1997) and conscientiousness (John & Srivastava, 1999) are important for goal setting, self-



control processes (e.g., delay discounting) are necessary for the subsequent step, which involves implementing the selected goal (Hagger et al., 2010). This raises the question of whether self-efficacy and conscientiousness can be regarded as relevant correlates of delay discounting, a consideration that until now has not been addressed in the literature.

### *The present study*

The present work is part of a larger study exploring the aging of people with childhood traumata (Burri et al., 2013; Kuhlman et al., 2013). The purpose of the current study is to extend the knowledge on motivational problems in traumatized individuals and investigate the relationship between childhood trauma and delay discounting in the elderly. To the best of our knowledge, this is the first study that addresses delay discounting in later life among individuals who have been exposed to trauma. The aim of the present work is twofold. First, based on existing findings that a history of abuse is associated with a lower level self-control, we hypothesized that elderly people with physical or sexual abuse in their life history would display a higher delay discounting rate (i.e., lower self-control) in comparison to elderly persons without abusive experiences in their life history. Second, we investigated predictors of delay discounting in old age following previous research. Given the lack of evidence for delay discounting in traumatic stress studies, the analyses were, to some extent, exploratory. In particular, we included sociodemographic characteristics (age, sex, years of education), history of abuse, current psychopathology (depressive symptoms), and motivational factors (self-efficacy, conscientiousness) in the model.

## **Methods**

### *Participants and Procedure*

Participants ( $N=153$ ) were Swiss elderly individuals in late adulthood ( $> 65$  years) with a mean age of 76.2 years ( $SD=5.4$ , range 66 - 90 years) with or without trauma exposure during

their childhood. All participants had to be fluent in Swiss-German or German, and they all provided written consent to participate in the study on a voluntary basis.

The first subsample ( $N=103$ ) consisted of former indentured child laborers, called “Verdingkinder”, with various trauma exposures (see Table 1). They were recruited by using a variety of strategies (advertisements in print media, travelling exhibition about “Verdingkinder”, a television broadcast, and snowball principle). The child laborers were typically children who were born out of wedlock, orphaned or raised in shattered/broken families. In Switzerland, until the 1970’s, the authorities had the power to remove such children from their families of origin and send them to farmers or children’s homes to work. Many of these children experienced numerous adverse or even traumatic events. Their everyday lives were hard, as they frequently were not allowed to go to school, were regularly beaten and frequently emotionally and sexually abused. This phenomenon represents a dark chapter in Swiss history. Data collection started in May of 2010 and ended in the summer of 2012 with 141 face-to-face interviews. Participants with missing values in the core variable delay discounting ( $n=15$ ), participants  $\leq 65$  years ( $n=5$ ) and participants without stated traumatic experiences ( $n=18$ ) were excluded from the final data set.

The non-traumatized control group ( $N=50$ ) had been investigated as part of a previous gerontological project (see Forstmeier et al., 2011). As data on traumatic exposure during childhood was missing in this sample, all participants ( $N=132$ ) were contacted by a letter in 2013 and were asked to provide information about their childhood adversities and traumas. In addition, they were asked whether they would grant permission to reuse their data from the 2007 project. The response rate was 66.7% ( $n=88$ ). After the exclusion of respondents with traumatic events during childhood, the final control group consisted of 50 subjects.

### *Measures*

*Delay Discounting Test.* Delay discounting was measured using the Swiss-German version of the Delay Discounting Test (DDT; Forstmeier & Maercker, 2011), also known as the Monetary Choice Questionnaire (Kirby et al., 1999). The questionnaire consists of 27 items, each with a choice of two hypothetical amounts of money, one smaller amount as an immediate reward and the other larger amount as a later reward (e.g., “Would you prefer Swiss francs [CHF] 87 today, or CHF 107 in 92 days?”). According to the approach invented by Kirby et al. (1999), there are four possible discounting rates: overall, small (CHF 32-44), medium (CHF 63-76) and large (CHF 95-107). In the present study, we emphasized primarily the global discounting rate ( $k$ ). Higher  $k$  values implied a greater preference for smaller immediate rewards, which is an indicator of a lower level of self-control or a higher level of impulsivity (Ainslie, 1975).

*Childhood Trauma Questionnaire.* In the trauma exposure group, the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) was applied to measure exposure to adversities and traumas during childhood, such as physical, sexual and emotional abuse and physical and emotional neglect. It is a 25-item self-report inventory with a 5-point response scale (1=never true, 5=very often true). In the present study, because it was specifically of interest whether a person had experienced a traumatic event as defined by the DSM-IV during childhood, only the subscales regarding physical and sexual abuse were considered. Values  $> 5$  indicated that abuse had occurred, regardless of the severity. Coefficient alphas for the physical and sexual abuse subscales were .86 and .95, respectively.

*Adverse Childhood Experiences Questionnaire.* The Adverse Childhood Experiences Questionnaire (ACE; Felitti et al., 1998) was used to assess childhood traumas in the non-traumatized group. To obtain comparable data, only the two items recording physical (“Did a parent or other adult in the household often or very often push, grab, slap, or throw something at you?”) and sexual (“Did an adult or an older person ever touch or fondle you in a sexual

way?”) abuse, which could be answered by a “yes” or a “no” were considered. In the present study, the non-traumatized control group consisted of participants who were neither physically nor sexually abused.

*Self-efficacy.* Self-efficacy was assessed with the well-established General Self-Efficacy Scale (GSE, Schwarzer & Jerusalem, 1995) that consists of 10 items rated on a 4-point scale. The internal consistency in the present sample was high ( $\alpha=.91$ ).

*Conscientiousness.* Conscientiousness was measured with the German short version (Koerner et al., 2008) of the conscientiousness subscale of the NEO Five Factor Inventory (McCrae & Costa, 2004). The 6 items were answered on a 5-point scale with a range from 0=strong disagreement to 4=strong agreement. The Cronbach’s alpha reached .68.

*Depressive symptoms.* Depressive symptoms were assessed using the Geriatric Depression Scale (GDS; Sheikh & Yesavage, 1986). The scale is comprised of 15 items where participants can respond “yes” or “no” depending on the existence of a symptom. The Cronbach’s alpha coefficient was .81.

#### *Data Analysis*

We compared the groups with regard to sociodemographic characteristics, the four delay discounting rates, motivational variables and depressive symptoms using one-way analysis of variance (ANOVA) or chi-square tests. Furthermore, bivariate correlations were calculated to examine the relationships between all study variables. As the normal distribution was not met, the delay discounting rates were log-transformed. A hierarchical multiple regression model was then run to predict the overall delay discounting rate. Step 1 included sociodemographic variables (age, sex, and years of education). In step 2, history of abuse was entered, which was dichotomously specified by being present or not present and was equivalent to belonging either to the group of indentured child laborers (all participants were either physically or sexually abused) or the control group (no physical or sexual abuse).

Finally, in steps 3 and 4, depressive symptoms and the motivational variables self-efficacy and conscientiousness were used as predictors.

## **Results**

Group comparisons among sociodemographic characteristics, delay discounting, motivational variables and depressive symptoms are presented in Tables 7 and 8. The trauma exposure group and control group did not differ with respect to age, sex distribution or self-efficacy. However, significant differences emerged with regard to years of education, marital status, and living conditions as former indentured child laborers were found to be less well-educated, more frequently divorced/separated or widowed, and more often living alone. Trauma characteristics differed between the two groups in that all participants in the trauma exposure group were either physically or sexually abused, while none of the controls reported either physical or sexual abuse in their life history.

In accordance with the first hypothesis, the trauma exposure group showed significantly higher values for all four delay discounting rates than the non-traumatized group.

**Table 7.** *Sociodemographic and trauma characteristics of the comparison groups*

	Former Indentured Child Laborers (n=103)		Controls (n=50)		$t/\chi^2$	$p$
	$M/n$	$SD/\%$	$M/n$	$SD/\%$		
Age	76.75	5.23	75.16	5.66	1.72	.087
Women	43	41.70	25	50.00	1.89	.169
Years of education	10.50	3.01	13.88	2.65	-6.78	.000
Marital status					53.72	.000
Single	7	6.80	6	12.00		
Married	42	40.78	33	66.00		
Divorced/separated	29	28.16	3	6.00		
Widowed	25	24.27	8	16.00		
Living condition					145.79	.000
Alone	47	45.63	10	20.00		
With spouse/partner	45	43.69	30	60.00		
Other	11	10.68	10	20.00		
Trauma characteristics			$n$	$\%$		
Physical abuse	14.40/74	6.29/71.84	0	0		
Sexual abuse	9.94/47	6.23/45.63	0	0		
Emotional abuse	15.33/70	5.87/67.96	3	6		
Emotional neglect	21.02/93	4.81/90.29	1	2		
Physical neglect	15.38/98	3.73/95.15	2	4		

*Note.* Living condition “other” includes “living with relatives”, “assisted living” and “flat-sharing community”. Trauma characteristics in former indentured child laborers are as follows: values from the CTQ-subcales using the clinically relevant cut-offs as suggested by Bernstein et al. (2003),  $\geq 10$  physical abuse,  $\geq 8$  sexual abuse,  $\geq 13$  emotional abuse,  $\geq 15$  emotional neglect,  $\geq 10$  physical neglect.

Trauma characteristics in controls use values from the ACE.

**Table 8.** Results of one way ANOVA for delay discounting, motivational variables and depressive symptoms

	Former Indentured Child Laborers ( <i>n</i> =103)		Controls ( <i>n</i> =50)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Delay discounting rate ( <i>k</i> )						
General	.079	.102	.028	.060	10.70	.001
Small reward size	.092	.105	.043	.072	8.88	.003
Medium reward size	.083	.104	.027	.059	12.11	.001
Large reward size	.078	.105	.024	.062	11.04	.001
Self-efficacy	29.60	6.57	28.94	4.56	.40	.530
Conscientiousness	18.90	3.49	20.10	2.49	4.54	.035
Depressive symptoms	3.74	3.70	2.62	1.12	4.35	.039

*Note.* Different *n* for self-efficacy (*n*=88), conscientiousness (*n*=88) and depressive symptoms (*n*=99) in former indentured child laborers.

Next, we examined the associations between all study variables (Table 9). The three specific DDT sub-levels correlated with conscientiousness non-significantly as follows: small DDT  $r=.02$ ,  $p=.39$ ; medium DDT  $r=.02$ ,  $p=.42$ ; large DDT  $r=.02$ ,  $p=.41$ . Furthermore, while the analysis revealed a significant low negative correlation between the small delay discounting rate and self-efficacy, it did not reveal this same correlation for the medium and large DDT levels (small DDT  $r=-.14$ ,  $p=.05$ ; medium DDT  $r=-.12$ ,  $p=.08$ ; large DDT  $r=-.11$ ,  $p=.10$ ).

**Table 9.** *Correlations among study variables in overall sample*

Variable	1	2	3	4	5	6
1. Delay discounting rate: general	-					
2. Years of education	.03	-				
3. Sex (0=f, 1=m)	-.11	.15*	-			
4. Depressive symptoms	-.10	-.20**	-.04	-		
5. Self-efficacy	-.13	.17*	.26***	-.24**	-	
6. Conscientiousness	.02	.14*	.02	-.23**	.38***	-

Note. \*= $p < .05$ , \*\*= $p < .01$ , \*\*\*= $p < .001$ .

The final hierarchical multiple regression model answered the second research question, and results are summarized in Table 10. The regression analysis revealed that years of education ( $\beta=.26$ ,  $p=.010$ ), history of abuse ( $\beta=.34$ ,  $p=.001$ ) and self-efficacy ( $\beta=-.23$ ,  $p=.018$ ) were predictive of the general delay discounting rate, thus explaining 13% of the variance. The last column in Table 4 shows the additional amount of variance that was explained when the respective block was entered in the last step of the analysis. Depressive symptoms explained 6% and motivational variables (i.e., conscientiousness, self-efficacy) explained 9% of the variance in the general delay discounting rate when all other variables were controlled.



**Table 10.** Summary of hierarchical regression analysis for variables predicting delay discounting rate: general (N=133)

Delay Discounting Rate: General				
	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$
Step 1				.00
Age	0.01	0.03	.03	
Sex (1=m, 0=f)	-0.49	0.37	-.12	
Years of education	0.17	0.06	.26**	
Step 2				.06
History of abuse (1=yes, 0=no)	1.50	0.43	.34***	
Step 3				.06
Depressive symptoms	-0.09	0.06	-.12	
Step 4				.09
Conscientiousness	0.08	0.06	.12	
Self-efficacy	-0.08	0.03	-.23*	

Note. Values belong to the final step of the analysis (Step 4).  $R^2=.13$ ,  $F(7, 126)=2.77$ ,  $p=.01$ . Effect size  $f^2=.15$ . \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

## Discussion

Comprehending the impact of traumatic stress on motivation is crucial because well-functioning motivational abilities are essential for succeeding in life. As a literature review finds a lack of studies exploring motivational factors as dependent variables after trauma exposure (Simmen-Janevska et al., 2012), the current study sought to examine and compare delay discounting in elderly individuals who had and who had not experienced trauma in their early lives. Our hypotheses were that in childhood physically or sexually abused individuals would favor immediate gratification to a greater extent than non-traumatized individuals, even after controlling for sociodemographic and motivational variables and depressive symptoms. The analyses supported the hypothesis such that former indentured child laborers had considerably higher delay discounting rates in all modalities than did individuals in the

control group. Accordingly, in response to the second question, the overall delay discounting rate was explained by a history of abuse, education and self-efficacy.

The findings of the current study correspond to previous investigations detecting steeper discounting rates in individuals with psychopathology than in healthy controls (Heerey et al., 2007; Kirby et al., 1999). The results are also in agreement with the finding that individuals with stressful experiences during early life tend to prefer immediate low rewards (Lovallo et al., 2013) or show lower levels of self-control (Henschel et al., 2013).

Several factors can explain the steeper discounting rate in the trauma exposure group compared to the non-trauma group. For example, a longitudinal study with a representative sample of young children (2- to 4-years-old) has demonstrated that self-regulatory capabilities may be jeopardized by poverty-related stressors, such as low birth weight as well as psychosocial (e.g., domestic violence), sociodemographic (e.g., single parenthood), and/or residential (e.g., neighborhood problems) risks (Li-Grining, 2007). More precisely, the study suggests that children's ability to control behavior and be attentive was negatively affected by poverty-related risks. As shown in a parallel analysis of the current sample (Kuhlman et al., 2013), the great majority of the former indentured child laborers were removed from their original homes, on average, at six years of age and faced not only poverty but also severe traumata. Therefore, it can be concluded that trauma exposure or the combination of trauma and additional socioeconomic stressors impaired the development of self-control abilities in those exposed to trauma at an early age and the effects are still apparent more than 70 years later. One further reason for higher delay discounting rates in the trauma exposure group may be rooted in their handicapped cognitive abilities. More specifically, Mischel et al. (2011) associated persistent delaying with performing cognitive control, which may be weaker among those in the trauma exposure group, as a previous investigation of that sample showed that posttraumatic stress symptoms negatively impacted the level of cognitive functioning

(Burri et al., 2013). Another potential explanation, however, not investigable in the current sample, may be that the trauma exposure group suffered more frequently from substance abuse disorders and thus displays higher delay discounting. From findings in previous studies, it can be expected that the trauma group was more affected by substance abuse than the non-trauma group (MacMillan et al., 2001). The connection between substance abuse and higher delay discounting has been established in the extant literature (Kirby & Petry, 2004).

Various variables were identified that significantly influenced current delay discounting. A history of abuse, which included either belonging to the trauma exposure group or the non-trauma group, self-efficacy, and years of education predicted delay discounting even after entering age, sex, depressive symptoms and conscientiousness in the hierarchical regression model. Specifically, trauma exposure was associated with elevated delay discounting, which coincides well, on the one hand, with the results of a study that reported a negative correlation between cumulative risk in childhood and delay of gratification (Evans et al., 2012), and on the other hand, with the theoretical postulate that chronic stress should increase poor impulse control (Metcalf & Mischel, 1999). There is some evidence of the causal link between the experience of stress and a certain subsequent shortsightedness related to future outcomes. For example, an experimental study addressed the question whether negative emotional states while experiencing threat influenced decision-making behavior (Gray, 1999). Subjects were presented with either aversive (e.g., plane crash) or neutral (e.g., cow in field) pictures. Those in the aversive condition performed worse in a moneymaking exercise, which the author interpreted as evidence of short-term thinking. Interestingly, a study that investigated delay discounting before and in the aftermath of a natural disaster found that participants displayed significantly steeper delay discounting behavior after the tragic incident than before (Li, Li, & Liu, 2011). Although they lived far from the disaster area and only followed the event in the media, individuals were prone to

smaller, more immediate gains. The authors suggested that such a disaster may lead to a shortsighted view with respect to making intertemporal choices. As traumatic exposure is clinically known to lead to a “sense of a foreshortened future”, as described in the PTSD syndrome, the participants in the trauma exposure group may, due to this experience, be induced to choose the smaller, more immediate option.

Self-efficacy significantly predicted delay discounting, with individuals with a higher level of self-efficacy favoring larger but delayed rewards, thus indicating stronger self-control. It is difficult to embed this finding in the existing literature. One previous study reported a small, negative but non-significant association between self-efficacy and delay discounting, a finding in the same direction as the results in the present study (Forstmeier & Maercker, 2011). Additionally, only a few experimental studies on ego depletion, the state of diminished self-control, have explored the role of self-efficacy (Baumeister et al., 2007). A meta-analysis has concluded that there is little research on the effect of self-efficacy on ego depletion tasks; however, the first indications are that the effect seems to be non-significant (Hagger et al., 2010). Notwithstanding, self-efficacy, as the belief in one’s own ability to succeed in specific situations (Bandura, 1997), must be high for strong goal commitment, and further, self-regulatory processes (e.g., self-control) are necessary to implement the chosen goal (Gollwitzer & Sheeran, 2006). From that perspective, the evident relationship between self-efficacy and delay discounting seems reasonable. Surprisingly, while educational level was a significant predictor of delay discounting, it was not in the expected direction. A higher educational level was correlated with a higher discounting rate or the preference for immediate smaller rewards, which is not consistent with a previous study reporting a negative relationship between delay discounting and education (Kirby et al., 2005). It is probable that those with a better education had a well-paying profession, and therefore, the amount of money in the delay discounting task is irrelevant. Finally, in previous studies, significant,

small (Renn, Allen, & Huning, 2011) to large (Duckworth, Tsukayama, & Kirby, 2013) positive relationships between delay of gratification and conscientiousness have been reported. This contradicts the data reported in the present study, which are similar to another investigation that failed to find a significant relationship between delay discounting and conscientiousness (Miller, Lynam, & Jones, 2008).

However, even though low delay discounting (i.e., high self-control) is associated with beneficial health-related functioning, it is questionable whether such self-control is helpful in every situation and whether high delay discounting represents an inability. Discounting level does not appear to be the result of deficient processing and correct or incorrect answering (Ahn et al., 2011). In fact, a newly developed normative perspective challenges the existing presumptions and concludes that the absence of patience for obtaining larger, later rewards is not necessarily a sign of low self-control, but rather a possible adaptive response to one's surroundings (McGuire & Kable, 2013). Moreover, Forstmeier et al. (2011) have shown that self-control is domain-specific. For example, someone who displays high self-control in monetary tasks does not necessarily behave the same way with respect to food. Thus, temporal beliefs, discounting rates, and gain sizes should be considered when predicting endurance. Consequently, why should a former indentured child laborer on the other side of life's course who has been forced to learn to do without from the early age, wait, on average, 74 days to obtain CHF 20 more than the immediate amount of money? Nonetheless, delaying gratification remains essential in old age (Drobetz et al., 2012) and is a meaningful factor in predicting successful therapeutic interventions (Sheffer et al., 2012). Given that the prevalence for both post-traumatic stress symptoms (23%; Burri et al., 2013), and clinically relevant depressive symptoms (38%; Kuhlman et al., 2013) is rather high in the present trauma exposure group, one might surmise that because of their low self-control abilities,

these individuals have not made use of psychotherapy and have not yet coped with their psychological strain.

Some limitations of the present study merit acknowledgement. First, due to the cross-sectional design of the present study, no direct causality can be implied that confirms the assumption that history of abuse negatively impacts delay discounting. Nevertheless, the assignment to the trauma exposure group was based on the objectifiable criterion that all individuals were officially indentured by the Swiss authorities. Second, we did not take into consideration the financial resources of the two groups, which also could have influenced the discounting rate (Green, Myerson, Lichtman, Rosen, & Fry, 1996). In fact, the control group consisted of participants who had attended the third-age university and very probably belonged to well-situated circles. Therefore, it is advisable to consider the financial situation as a confounder. Third, using the delay discounting questionnaire as a measure of self-control in the trauma context may need modification because other factors, such as acknowledgement or appreciation, may be more relevant than the relatively small monetary incentives. Furthermore, even though the delay discounting paradigm has been proved reliable and valid in older population samples (Forstmeier & Maercker, 2011), its application in clinical samples may need adaptation (Rounds et al., 2007). Another feasible approach is to choose between different behaviors in everyday situations (e.g., taking a headache tablet instead of taking a walk) or use other rewards (e.g., snacks or magazines), a strategy applied in the Delay of Gratification Test for Adults (Forstmeier et al., 2011).

To sum up, the current study with former indentured child laborers assesses delay discounting in late-life individuals with trauma exposure during childhood. Its strengths are based on this particular sample of traumatized individuals and the control group design. We found greater delay discounting among those in the trauma exposure group than among the controls. The results further suggest that a history of physical or sexual abuse during

childhood, self-efficacy, and education may make a significant contribution to decision-making behavior in later life. Further studies may add to the research by replicating the results presented herein.

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## **Publications**

### **Peer reviewed articles**

- Burri, A., Maercker, A., Krammer, S., Simmen-Janevska, K. (2013): Childhood trauma and PTSD increase the risk of cognitive impairment in a sample of former indentured child laborers in old age. *PLoS ONE* 8. Retrieved from <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0057826>
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- Simmen-Janevska, K., Forstmeier, S., Krammer, S., & Maercker, A. (submitted). Does trauma impair self-control? Differences in delay discounting between former indentured child laborers and non-traumatized controls.
- Simmen-Janevska, Horn, A. B., Krammer, S. & Maercker, A. (accepted). Traumata, Entwicklungsperioden und motivationale Fähigkeiten bei Schweizer Verdingkindern im Alter. *Zeitschrift für Psychosomatische Medizin und Psychotherapie*.

### **Book chapters and overview articles**

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### **Poster and oral presentations**

- Simmen-Janevska, K., Horn, A., Krammer, S., & Maercker, A. (June, 2013). *Does age at trauma exposure matter in the development of motivational abilities?* Poster presented at the 13<sup>th</sup> European Conference on Traumatic Stress in Bologna, Italy.
- Simmen-Janevska, K., & Maercker, A. (2012, September). *Ehemalige Verding- und Heimkinder im Alter*. Oral presentation at the 8<sup>th</sup> Münsterlinger Symposium für Alterspsychotherapie in Münsterlingen, Switzerland.
- Simmen-Janevska, K., Krammer, S., & Maercker, A. (March, 2012). *Problems with delay of gratification in traumatized older adults? – An exploratory analysis*. Poster presented at the 14<sup>th</sup> Jahrestagung der Deutschsprachigen Gesellschaft für Psychotraumatologie in Hamburg, Germany.
- Simmen-Janevska, K., Krammer, S., & Maercker, A. (June, 2011). *Childhood adversities and health/cognition in old age*. Poster presented at the 12<sup>th</sup> European Conference on Traumatic Stress in Vienna, Austria.

# The overlooked relationship between motivational abilities and posttraumatic stress: a review

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How does traumatic stress change the ability to motivate oneself to achieve certain goals? How do motivational abilities influence the development and course of trauma sequelae? Few studies have focused on motivational constructs within posttraumatic stress research. From a trauma research perspective, it can be hypothesized that traumatic stress may contribute to motivational dysfunction. The main goal of the present article is to fill this gap in research by reviewing and discussing the existing trauma literature in terms of motivation-related concepts, such as self-efficacy, locus of control, self-esteem, and self-control/impulsivity. Fifty-four studies were reviewed, 10 of which were longitudinal studies. Approximately 20% of the reviews assessed whether motivational concepts predict posttraumatic stress, whereas only 8% examined the reverse relationship. With the exception of a few studies, motivational constructs seem to predict posttraumatic stress over the life span. The strongest relationships were reported for self-efficacy, followed by locus of control and self-esteem and, lastly, impulsivity/self-control. Overall, the findings of this review indicate that there is a lack of research investigating motivational factors as outcome variables following traumatic experiences. Furthermore, the need for longitudinal studies and studies with older adults is noted.

Keywords: *Motivation; PTSD; trauma; self-efficacy; locus of control; self-esteem; impulsivity*

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Experiencing traumatic events, such as sexual abuse, natural disasters, or physical violence, often leads to serious changes in the psychological makeup of a person, particularly if a posttraumatic stress disorder (PTSD) develops. The traumatic sequelae include changes in motivation, cognition, and emotion.

Motivation is an umbrella term for a wide array of cognitive and affective processes that are involved in goal-directed behavior. Goals, which are defined as “internal representations of desired states, where states are broadly construed as outcomes, events, or processes” (Austin & Vancouver, 1996, p. 338), are at the center of motivational analysis (Bargh, Gollwitzer, & Oettingen, 2010). The pursuit of personally meaningful goals plays a pivotal role in individuals’ well-being and their life adjustments (Brunstein, Schultheiss, & Maier, 1999). There is abun-

dant empirical evidence that progress in the achievement of personal goals relates to personal well-being (Brunstein, Schultheiss, & Grässmann, 1998). From this point of view, it seems of utmost importance to analyze whether traumatic stress affects factors known to be relevant to successful goal pursuit, as the inability to successfully strive for personal goals might aggravate the psychological condition of traumatized individuals.

Current motivational theorizing on goal striving distinguishes two related although conceptually distinct aspects, which are, on the one hand, selecting a goal from a variety of action alternatives (goal setting) and, on the other hand, pursuing the chosen goal vigorously (goal implementation) (Bargh et al., 2010). Goal setting is dependent on desirability and feasibility considerations, as illustrated, for example, in the influential

expectancy-value-model of task choice (Atkinson, 1957) and in the theory of planned behavior (Ajzen & Fishbein, 1980). There are diverse constructs that can be subsumed under the concept of expectancy. More specifically, self-efficacy (Bandura, 1997), control beliefs (locus of control: Rotter, 1966), and self-esteem (Park, Crocker, & Kiefer, 2007) need to be high for strong goal commitments to emerge. Goal implementation, however, hinges on self-regulatory processes that are necessary to cope effectively with typical problems, such as initiating goal-directed actions (forming implementation intentions: Gollwitzer & Sheeran, 2006), persisting in the face of competing action tendencies (action control: Kuhl, 1984), and suppressing impulsive reactions (self-control: Hagger, Wood, Stiff, & Chatzisarantis, 2010).

Presently, goal-directed behavior has been studied in various psychological domains; however, most domains are outside of abnormal or clinical psychology, with the exception of studies regarding obsessive compulsive disorder (Woody & Szechtman, 2011) or treatment studies (Chard, Schumm, Owens, & Cottingham, 2010). In general, studies have reported a beneficial relationship between motivational components and psychological well-being (Forstmeier & Maercker, 2008) and favorable health behaviors (McAuley et al., 2007).

In the context of trauma, individuals respond to a traumatic event with intense fear, helplessness, or horror, and they perceive the stressor as uncontrollable or unpredictable (Foa, Zinbarg, & Rothbaum, 1992). Undergoing such uncontrollable adversities can lead to learned helplessness (Seligman, 1975) and, consequently, negatively influence outcome expectations. From a psycho-traumatological perspective, for example, we can assume that a woman who has become a victim of chronic sexual abuse will show diminished initiative to actively respond to life requirements in comparison to a non-traumatized person of the same age. Moreover, she may be unable to learn from successful experiences, engage in less or restricted future planning, and develop affective deficits, such as anxiety or depression. A reformulated module of the original helplessness hypothesis has been supplemented with an attributional framework (Abramson, Seligman, & Teasdale, 1978). In particular, stable, global, and internal attributions determine the occurrence of helplessness after an adverse event. To illustrate, a war veteran who has witnessed mass killing may consider himself a loser (internal attribution) who will fail to fulfill any future intentions (global attribution) due to a lack of personal abilities (stable attribution). This personal helplessness will result in low self-esteem.

Researchers have argued that helplessness has the greatest impact on motivational deficits (Maier & Seligman, 1976). As helpless individuals show diminished expectancies for future success, their behavior may result in delayed proactive intentions (Abramson et al., 1978), which, in

turn, may have a negative impact on goal setting and goal implementation. A closer look at the PTSD syndrome reveals that the symptoms in the avoidance/numbing cluster are motivational in nature, particularly “marked diminished interest in significant activities” (B4) and a “sense of a foreshortened future” (e.g., “does not expect to have a career, marriage”) (B7). All of these symptoms help the traumatized individual to escape from his or her painful past (Foa et al., 1992).

Given that helplessness is an important factor in the context of trauma, we would assume that a loss of control can influence motivational deficits by diminishing the subjective expectancies to steer future personal undertakings. Although the etiology research is particularly interested in whether motivation influences PTSD, the life-span research focuses more on whether PTSD or traumatic stress has an impact on motivation and goal striving. Therefore, the aim of the present review is to summarize the existing findings in the area of trauma/PTSD and motivation. For this reason, we chose a life-span approach and compiled relevant results from childhood to older adulthood.

## Outline of the included motivation-related constructs

Uncontrollable traumatic events may result in learned helplessness and, consequently, promote motivational deficits. Because subjective expectancies represent core competencies with regard to goal-directed behavior, it is possible that individuals affected by traumatic stress often lack motivational abilities. Accordingly, the motivational phenomena included in this review focus on the constructs that are related to goal setting and goal implementation and are frequently discussed in the trauma literature.

In trauma research, a number of studies have been conducted examining the motivational aspects of self-evaluation, such as self-efficacy, locus of control, and self-esteem (Judge, Erez, Bono, & Thoresen, 2002). We acknowledge that self-esteem can be considered a psychological construct that does not necessarily lead directly to goal attainment (Bandura, 1997). Nevertheless, self-esteem has frequently been linked to promoting motivation and effective behavioral outcomes (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Self-control is important for goal implementation (Hagger et al., 2010) and has played a significant role in trauma research as well. We excluded motivation-related concepts that were not considered core concepts in motivational psychology, but that have been debated in traumatic stress research, including changed life priorities (Calhoun & Tedeschi, 2006), self-enhancement (Bonanno, 2004), existential goal seeking (Reker & Woo, 2011), hardiness (Kobasa, 1979), or optimism (Scheier, Carver, & Bridges, 1994).

Although measures of the self-efficacy, locus of control, and self-esteem constructs share common variance, and it is recommended to integrate the literature on these constructs (Judge et al., 2002), we decided to use the traditional separation structure. In choosing this approach, we highlight the variance that is unique to each construct. In addition, the separation represents the actual state of the art in which these constructs are treated in trauma research.

### *Self-efficacy*

Bandura (1997) defined the construct of self-efficacy as one's belief in one's ability to succeed in specific situations. Such beliefs influence motivational regulation, so that individuals model their own goals by investing an effort toward the expected outcome. Self-efficacy can be task- and situation-specific. A number of researchers understand self-efficacy as the self-evaluation of personal coping capabilities to manage environmental requirements following a traumatic event and refer to this as coping self-efficacy (Benight & Bandura, 2004). Other researchers conceptualize self-efficacy as a generalized conviction in being able to fulfill demanding requirements in a wide range of domains (Schwarzer & Jerusalem, 1995).

### *Locus of control*

This construct refers to the extent to which individuals believe that they can control events that affect them (Rotter, 1966). Two forms of locus of control are traditionally distinguished: internal and external. An internal locus of control implies that one's own behavior is seen as the main controlling factor for events in life. In contrast, an external locus of control implies that outcomes in one's life are due to chance, luck, fate, or are influenced by other powerful individuals.

### *Self-esteem*

Self-esteem is the personal appraisal of one's own self-worth (Fleming & Watts, 1980), which has a multi-dimensional nature and can vary in different life domains (Bandura, 1997). Interpersonal or man-made traumatic events, such as acts of extreme humiliation, primarily serve to intentionally reduce self-esteem (Baumeister, Smart, & Boden, 1996). However, it is conceivable that self-esteem declines in the context of accidental traumas, such as natural disasters, and may be influenced by survivor guilt, which many trauma victims experience (Hull, Alexander, & Klein, 2002).

### *Impulsivity/self-control*

Impulsivity has been established as the counterpoint to self-control, with many researchers treating these constructs as two sides of the same coin (Hofmann, Friese, &

Strack, 2009). Impulsivity is defined as the tendency to execute actions imprudently and rapidly, without considering their possible negative consequences (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Studies have shown that having high levels of self-control is related to lowered likelihood of psychopathology (Tangney, Baumeister, & Boone, 2004).

### *Aim of the review*

To our knowledge, no review article is available that addresses the full range of specified motivation-related concepts in the trauma literature. The findings from Luszczynska, Benight and Cieslak's (2009) review article show strong cross-sectional and longitudinal associations between self-efficacy and general distress (e.g., anxiety and depression) and PTSD in adults and adolescents with exposure to a collective trauma. Given that those authors focused exclusively on the association between self-efficacy and psychological/somatic outcomes after a collective trauma, the main goal of our review is to go one step further and present and summarize the empirical evidence concerning the role of self-efficacy, locus of control, self-esteem, and impulsivity in individuals who have experienced individual or collective traumatic events over their lifespan. Four studies (Benight et al., 1997; Benight & Harper, 2002; Saigh, Mroueh, Zimmerman, & Fairbank, 1995; Sumer, Karanci, Kazak Berument, & Gunes, 2005) that were reviewed by Luszczynska et al., (2009) will also be analyzed in the present article, as these articles met our selection criteria.

The present article aims to synthesize the empirical findings regarding the relationship between motivational variables and traumatic stress. Based on extant theory, the main assumption of the current review is that traumatic stress should decrease motivational capacities. First, we will investigate whether longitudinal studies have been conducted and, if so, whether these studies allow us to draw conclusions about the direction of the effects. We will then examine the function of the four constructs on which research has largely focused, primarily examining their roles as predictors and mediators, as well as outcomes. Finally, we will investigate gender-related effects.

### *Method*

For this review, studies published in peer-reviewed journals prior to August 2011 were selected through a computerized literature search using the PsychINFO, PubMed, and PILOTS databases. The included articles examined the direct or indirect relationship between motivational variables and traumatic distress/adversities across the life span. Initially, we performed a search using a combination of the terms "trauma\*/advers\*" and terms for every motivational aspect. More precisely, we combined the terms "trauma\*/advers\*" with "self-efficacy",



“locus of control”, “self-esteem”, and “impuls\*”. To limit the number of search results, we only considered studies that contained these terms either in the title or in the abstract. This procedure generated over 700 studies. Next, we scanned the abstracts of the remaining studies and included only those that were quantitative and published in English language journals. Moreover, we made no restrictions in terms of age of the sample, type of trauma, and nature of the motivational variables (e.g., general self-efficacy or coping self-efficacy). In addition, studies that covered a wide range of physical and mental health outcomes were reviewed. Excluded were therapeutic intervention studies and studies that dealt with resilience or exclusively with medical concerns. Studies with traumatized subjects that included one motivation-related construct, but did not test the association between traumatic stress/PTSD and that specific construct, were eliminated from this analysis. The final search yielded 54 articles to be critically reviewed.

## Results

### Overview of relevant studies

In total, 54 studies were identified as relevant (Table 1). Approximately one-fifth of the studies had a longitudinal design. Most studies dealt with the construct self-esteem, within which all but one study had a cross-sectional design.

The majority of the studies (approx. 54%) included samples of young adults aged 22 to 40 years, followed by samples of children and adolescents aged between 0 and 21, which accounted for approximately one-third of the studies. Nine studies considered samples with middle-aged individuals aged 41 to 60 and only two studies examined data from samples with adults aged 60 and older.

To obtain a more comprehensive picture of the trauma type, Table 2 lists the data provided in the literature reviewed. For this purpose, we have chosen the categorization proposed by Luz et al. (2011). As a result, individual traumas clearly predominate, specifically child abuse, followed by war-related traumas and natural disasters.

**Table 1.** Number of studies arranged by research design

Construct	Longitudinal	Cross-sectional	Subtotals
Self-efficacy	8	7	15
Locus of control	1	14	15
Self-esteem	1	19	20
Impulsivity	0	9	9

Note: Five studies have been counted double.

### Findings from longitudinal studies

The findings from 10 longitudinal studies are presented in Table 3.

Conclusions from eight longitudinal studies on self-efficacy are as follows. First, there is evidence for a moderate to strong negative longitudinal association between self-efficacy and PTSD (Benight et al., 2008; Benight & Harper, 2002; Johansen et al., 2007), meaning that individuals with high levels of self-efficacy experience less traumatic symptoms and, conversely, individuals with low self-efficacy report more traumatic symptoms. Second, the primary focus of the reviewed studies was the predictive role of self-efficacy on PTSD or overall distress after trauma exposure, which was confirmed in four samples (Benight & Harper, 2002; Heinrichs et al., 2005; Johansen et al., 2007; Murphy, 1988). That is, having a high or low degree of self-efficacy prior to the trauma seems to be related to lower or higher PTSD symptoms over time. Third, there is an indication that self-efficacy mediates the effect of acute stress/baseline PTSD on subsequent PTSD (Benight et al., 2008; Benight & Harper, 2002). Expressed differently, self-efficacy may determine whether acute stress immediately after trauma influences the progression of PTSD over time. Fourth, one study revealed the reverse effect of traumatic stress predicting self-efficacy (Solomon et al., 1991). Finally, self-efficacy appears to remain stable over time (Heinrichs et al., 2005; Johansen et al., 2007; Solomon et al., 1991). However, this finding from three studies should be viewed with caution, as the factors contributing to self-efficacy may be different across studies.

With regard to locus of control, one study concluded that an internal locus of control predicts a decrease in PTSD intensity (Solomon et al., 1988), which suggests that individuals who are convinced that they can control their life events will suffer less from PTSD symptoms.

The only longitudinal study on self-esteem reported a weak negative correlation between self-esteem and traumatic stress in children (Lynch & Cicchetti, 1998). Specifically, subjects with favorable appraisals of their self-worth seemed to be less affected by PTSD.

### Findings from cross-sectional studies

The results of cross-sectional studies are organized in Tables 4, 5, 6, and 7. We use the same structure that was applied by the authors in the original articles, namely, the organization by predictor, mediator, and outcome. Given the cross-sectional nature of the studies, we emphasize that this approach is used to simplify the presentation of the studies' results and is not intended to convey an assumption of causal relationships.



**Table 2.** Categorization of traumatic events

	Self-efficacy	Self-esteem	Locus of control	Impulsivity	Total
Collective trauma	8	5	10	0	23
War-related trauma	2	2	5	–	9
Natural disaster	4	2	2	–	8
Chronic complex exposure in high-risk professions	2	–	3	–	5
Terrorism	–	1	–	–	1
Individual trauma	7	15	5	9	36
Child abuse	2	8	3	5	18
Medical causes	2	3	–	–	5
Mixed trauma population	–	2	–	2	4
Child abuse/non-A1 event	–	1	1	1	3
Injury	–	–	1	1	2
Insufficient information	1	1	–	–	2
Violent crime	1	–	–	–	1
Motor vehicle accident	1	–	–	–	1

*Note:* Five studies examined more than one concept and were counted double (war-related, natural disaster, chronic complex exposure, child abuse/non-A1 event, insufficient information).

### Self-efficacy

Table 4 presents the cross-sectional results regarding the relationship between self-efficacy and traumatic stress. The significant weak to strong negative correlations between self-efficacy and posttraumatic stress in adults varied from  $r = -0.18$  in professional firefighters (Regehr et al., 2000) to  $r = -0.70$  in survivors of a natural disaster (Benight et al., 1997). The findings from a student sample indicated no relationship between maltreatment in childhood and self-efficacy for boys, and a significant small association between those variables for girls (Wolfe et al., 2004). One study of adolescents (Saigh et al., 1995) and one of adults (Bender et al., 2010) revealed that individuals with lower levels of self-efficacy tended to meet the criteria for PTSD more often than did individuals with higher levels of self-efficacy. In addition, two studies examined the mediating role of self-efficacy (Cieslak et al., 2008; Sumer et al., 2005). In the first study (Cieslak et al., 2008), coping self-efficacy functioned as a mediator between negative cognitions and posttraumatic distress. In the second study (Sumer et al., 2005), although coping self-efficacy was significantly negatively related to general psychological distress and intrusion, it did not mediate the association between trauma exposure and psychological distress in survivors of an earthquake.

### Locus of control

Table 5 depicts the studies that included locus of control in their analyses. The cross-sectional findings regarding locus of control are inconsistent. The vast majority of the studies that we reviewed report a small to medium

positive relationship between an external locus of control and traumatic stress (Al-Turkait & Ohaeri, 2008; Kuterovac-Jagodic, 2003; Maercker & Herrle, 2003; Mellon et al., 2009; Weiss et al., 1995). That is, individuals who do not feel in control over the events in their lives tend to be affected by posttraumatic symptoms to a greater degree. With regard to an internal locus of control, the findings are contradictory. One study reported a medium negative correlation in soldiers (Solomon et al., 1988) while other studies have found that an internal locus of control was significantly related to the PTSD symptoms of avoidance and re-experiencing, but not to hyperarousal (Chung et al., 2006; Maercker & Herrle, 2003). In contrast, some studies did not find a significant correlation between locus of control and posttraumatic distress in firefighters (Brown et al., 2002; Regehr et al., 2000) or in children with exposure to domestic violence (Kilpatrick & Williams, 1998). Furthermore, the mediator and moderator roles of locus of control still remain unclear (Maercker & Herrle, 2003; Simoni & Ng, 2002). Only one study examined the role of locus of control as an outcome and found that childhood adversities, especially emotional neglect and bullying by peers, explained variance in the external locus of control (Klensmedan Fosse & Hølen, 2007).

### Self-esteem

Self-esteem has frequently been studied in trauma research, both in samples with children and adults. The results are shown in Table 6.

Findings from cross-sectional studies appear to be consistent in that there is a small to medium negative

Table 3. Longitudinal findings

Authors	Construct	Sample	Design	Main Finding
Benight, Cieslak, Molton, & Johnson, 2008	CSE (predictor, mediator)	Motor vehicle accident ( $N = 70$ ) Adulthood Mixed gender ( $F = 63\%$ )	1 group Assessment at approx. 7, 30, and 90 days post-event	$r = -0.57^{***}$ between CSE (T1) and PTSD (T3) $R^2 = 0.19$ change CSE (T1 to T2), PTSD (T1) and involvement in litigation predict PTSD (T3) CSE (T2) mediates relation between PTSD (T1) and PTSD (T3) $\eta^2 = 0.36$ CSE increases from T1 to T2 No gender differences regarding CSE
Johansen, Wahl, Eilertsen, & Weisaeth, 2007	SE (predictor)	Non-domestic violence ( $N = 70$ ) Adulthood Mixed gender ( $F = 17\%$ )	1 group Assessment at few days – 16 weeks, 3, and 12 months post-event	$r = -0.44^{***}$ between SE (T1) and PTSD (T2) and $r = -0.25^*$ between SE (T1) and PTSD (T3) No change in SE from T1 to T3
Heinrichs et al., 2005	SE (predictor)	Firefighters ( $N = 43$ ) Early adulthood Male	1 group Assessment at baseline, 6, 9, 12 and 24 months post-training	$R^2 = 0.42$ SE (T1) and hostility (T1) predict PTSD (T5) No change in SE from T1 to T5
Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004	SE (predictor)	Dating violence ( $N = 1317$ ) Adolescence Mixed gender ( $F = 55\%$ )	1 group Assessment at baseline and 12 months post-event	SE (T1) does not predict dating violence (T2) in boys and girls SE stable from T1 to T2 for both genders
Benight & Harper, 2002	CSE (predictor, mediator)	Natural disaster ( $N = 46$ ) Middle adulthood Mixed gender ( $F = 41\%$ )	1 group Assessment at 3–8 weeks and 12 months post-event	$r = -0.65^{**}$ between CSE (T1) and PTSD (T2) $R^2 = 0.07$ CSE (T1) and PTSD (T1) predict PTSD (T2) CSE (T1) mediates relation between acute stress (T1) and PTSD (T2) and between acute stress (T1) and general psychological distress (T2) Lower CSE in females
Koopman et al., 2002	SE (predictor)	Breast cancer ( $N = 117$ ) Adulthood Female	1 group Assessment at baseline and 6 months post-diagnosis	SE (T1) does not predict PTSD (T2)
Solomon, Benbenishty, & Mikulincer, 1991	SE (outcome)	Frontline soldiers ( $N = 65$ ) Early adulthood Male	1 group Assessment at 12, 24 and 36 months post-event	$R^2 = 0.60$ psychic numbing in combat (T1), psychopathology (T2) and pre-military adjustment (T1) predict SE (T2) No change in SE from T1 to T3
Murphy, 1988	SE (predictor)	Natural disaster ( $N = 101$ ) Early adulthood Mixed gender ( $F = 70\%$ )	1 group Assessment at baseline and 24 months post-event	$R^2 = 0.19$ SE (T1) predicts general distress (T2) $R^2 = 0.17$ SE (T1) predicts depression (T2) $R^2 = 0.12$ SE (T1) predicts somatization (T2)
Lynch & Cicchetti, 1998	Self-esteem (outcome)	Childhood trauma ( $N = 322$ ) Childhood Mixed gender ( $F = 37.3\%$ )	2 groups (Maltreated vs. controls) Assessment at baseline and 12 months post-event	$r = -0.13^*$ between childhood trauma (T1) and self-esteem (T2)
Solomon, Mikulincer, & Avitzur, 1988	LOC (predictor)	Frontline soldiers ( $N = 262$ ) Early adulthood Male	1 group Assessment at 24 and 36 months post-event	Partial $r = -0.19^{**}$ between LOC (T1) and PTSD (T2), controlled for PTSD (T1) Change in LOC from T1 to T2, LOC becomes more internal

Note: CSE = coping self-efficacy; SE = self-efficacy; LOC = locus of control; gender, F = female; childhood/adolescence = 0–21 years; early adulthood = 22–40 years; middle adulthood = 41–60 years; adulthood = from early to old adulthood (> 60 years); \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 4.** Self-efficacy: cross-sectional findings

Authors	Sample	Design	Main Finding
Bender, Ferguson, Thompson, Komlo, & Pollio, 2010	Homelessness ( $N = 146$ ) <sup>1</sup> Early adulthood Mixed gender ( $F = 37\%$ )	1 group	Lower SE in individuals with PTSD vs. no PTSD
Kohno et al., 2010	Gastrointestinal cancer ( $N = 47$ ) Adulthood Mixed gender ( $F = 32\%$ )	1 group	$r = -.36^*$ between SE and posttraumatic stress symptoms
Cieslak, Benight, & Caden Lehman, 2008 (Study 1)	Childhood trauma ( $N = 66$ ) Early and middle adulthood Female	1 group	$r = -.57^{***}$ between CSE and posttraumatic distress CSE mediates relation between negative cognitions about self/world and posttraumatic distress
Sumer, Karanci, Kazak Berument, & Gunes, 2005	Natural disaster ( $N = 350$ ) Adulthood Mixed gender ( $F = 52\%$ )	1 group	$R = -.24^{***}$ between SE and intrusion and $r = .03$ between SE and avoidance SE does not mediate relation between trauma exposure and psychological distress Lower SE in females
Wolfe et al., 2004	Dating violence ( $N = 1317$ ) Adolescence Mixed gender ( $F = 55\%$ )	1 group Assessment at baseline and 12 months post-event	No significant $r$ (not reported) between SE (T1) and child maltreatment (T1) in boys $r = -.17^{***}$ between SE (T1) and child maltreatment (T1) in girls
Koopman et al., 2002	Breast cancer ( $N = 117$ ) Adulthood Female	1 group Assessment at baseline and 6 months post-diagnosis	$r = -.27^{**}$ between SE (T1) and impact of illness (T1) $R^2 = .34$ SE (T1) and postsurgical treatment (T1) predict PTSD (T1)
Regehr, Hill, & Glancy, 2000	Firefighters ( $N = 164$ ) Adulthood Male	2 groups (Professionals vs. volunteers)	$r = -.18^*$ between SE and posttraumatic stress symptoms
Benight et al., 1997	Natural disaster ( $N = 79$ ) Early and middle adulthood Male	2 groups (HIV-Infected vs. controls)	$r = -.70^{**}$ between CSE and PTSD in HIV-Infected $r = -.55^{**}$ between CSE and PTSD in Controls $R^2 = .51$ SE predicts PTSD in HIV-Infected $R^2 = .27$ SE predicts PTSD in Controls
Saigh, Mroueh, Zimmerman, & Fairbank, 1995	War ( $N = 30$ ) Childhood Mixed gender ( $F = 37\%$ )	3 groups (PTSD +, traumatized PTSD -, controls)	Lower SE in individuals with PTSD vs. no PTSD

Note: <sup>1</sup> = Trauma type not specified; SE = self-efficacy; CSE = coping self-efficacy; gender F = female; childhood/adolescence = 0–21 years; early adulthood = 22–40 years; middle adulthood = 41–60 years; adulthood = from early to old adulthood (>60 years); \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 5. Locus of control: cross-sectional findings

Authors	Sample	Design	Main Finding
Mellon, Papanikolaou, & Prodroimitis, 2009	Natural disaster ( $N=800$ ) Adulthood Mixed gender ( $F=47.9\%$ )	2 groups (Affected areas vs. non-affected areas)	$r=.15^{***}$ between external LOC and traumatic stress in Affected Areas $r=.05$ between external LOC and traumatic stress in Non-Affected Areas
Al-Turkait & Ohaeri, 2008	Military men ( $N=200$ ) Adulthood Male	4 groups (Retired vs. active-in-army vs. involved-in-combat vs. prisoners of war)	$r=.20^*$ between external LOC and traumatic stress No difference in LOC between groups
Klensmeden Fosse & Holen, 2007	Childhood trauma ( $N=160$ ) Early adulthood Mixed gender ( $F=67\%$ )	1 group	$R^2=.09$ emotional neglect and bullying by peers predict external LOC
Chung, Preveza, Papandreou, & Prevezas, 2006	Spinal cord injury ( $N=116$ ) Middle adulthood Mixed gender ( $F=33.6\%$ )	2 groups (Spinal cord injury vs. controls)	Adjusted $R^2=.13$ internal LOC predicts re-experiencing Adjusted $R^2=.20$ internal LOC predicts avoidance
Kuterovac-Jagodic, 2003	War ( $N=252$ ) Childhood Mixed gender ( $F=49\%$ )	1 group	$r=.39^{***}$ between external LOC and traumatic stress $R^2=.36$ LOC, exposure to violence, expressive coping, social support and age predict PTSD Higher external LOC in boys
Maercker & Herrle, 2003	War ( $N=47$ ) Middle to old adulthood Mixed gender ( $F=81\%$ )	1 group	$r=.46^{**}$ between external LOC and intrusions, $r=.51^{**}$ between external LOC and avoidance, $r=.54^{**}$ between external LOC and hyperarousal $r=.36^*$ between internal LOC and avoidance, $r=.21$ between internal LOC and intrusions, $r=.14$ between internal LOC and hyperarousal External LOC mediates relation between trauma exposure and PTSD Internal LOC moderates relation between trauma exposure and PTSD
Brown, Mulhern, & Joseph, 2002	Firefighters ( $N=248$ ) Adulthood Male	1 group	$r=.05$ between LOC and traumatic stressors
Simoni & Ng, 2002	Childhood trauma ( $N=222$ ) Adulthood Female	1 group	LOC does not mediate relation between childhood trauma and adult physical health
Suar, Mandal, & Khuntia, 2002	Natural disaster ( $N=130$ ) Early adulthood Mixed gender ( $F=38.5\%$ )	2 groups (Affected Areas vs. non-affected areas)	Higher external LOC in individuals with traumatic stress vs. no traumatic stress
Regehr et al., 2000	Firefighters ( $N=164$ ) Adulthood Male	2 groups (Professionals vs. volunteers)	$r=-.03$ between internal LOC and traumatic stress

Table 5 (Continued)

Authors	Sample	Design	Main Finding
Kilpatrick & Williams, 1998	Domestic violence ( $N = 35$ ) Childhood Mixed gender ( $F = 48.6\%$ )	2 groups (Exposed vs. controls)	LOC does not predict PTSD
Weiss, Marmar, Metzler, & Ronfeldt, 1995	Emergency services personnel ( $N = 367$ ) Early adulthood Mixed gender ( $F = 10.6\%$ )	2 groups (Exposed to natural disaster vs. controls)	$r = .23^{**}$ between external LOC and PTSD
Hall, Bolen, & Webster, 1994	Childhood trauma ( $N = 315$ ) Early adulthood Mixed gender ( $F = 70\%$ )	3 groups (Exposed to parental alcoholism vs. exposed to other trauma vs. controls)	No difference in LOC in individuals with and without traumatic stress
Solomon et al., 1988	Frontline soldiers ( $N = 262$ ) Early adulthood Male	1 group Assessment at 24 and 36 months post-event	$r = -.38^{**}$ between internal LOC (T1) and PTSD (T1)
Hyer, Boudewyns, O'Laery, & Harrison, 1987	War ( $N = 75$ ) Early adulthood Gender not reported	1 group	$R^2 = .75$ external LOC and current stress level predict PTSD

Note: LOC = locus of control; gender, F = female; childhood/adolescence = 0–21 years; early adulthood = 22–40 years; middle adulthood = 41–60 years; adulthood = from early to old adulthood (>60 years); \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 6. Self-esteem: cross-sectional findings

Authors	Sample	Design	Main Finding
Grasso et al., 2011	Various potentially traumatic events ( $N = 3119$ ) Adolescence Mixed gender ( $F = 45\%$ )	1 group	$R^2 = .10$ self-esteem and social support predict PTSD
Kuo, Goldin, Werner, Heimberg, & Gross, 2011	Childhood trauma ( $N = 132$ ) Early adulthood Mixed gender ( $F = 66.7\%$ )	2 groups (Social anxiety disorder vs. controls)	$r = -.44^{***}$ between self-esteem and emotional neglect $r = -.35^{***}$ between self-esteem and emotional abuse $r = -.06$ between self-esteem and physical neglect $r = -.13$ between self-esteem and physical abuse $r = -.06$ between self-esteem and sexual abuse
Bender et al., 2010	Homelessness ( $N = 146$ ) <sup>1</sup> Early adulthood Mixed gender ( $F = 37\%$ )	1 group	No difference in self-esteem in individuals with and without trauma exposure
Hotun Sahin et al., 2010	Childhood trauma ( $N = 750$ ) Adulthood Female	1 group	$r = -.64^{***}$ between self-esteem and childhood trauma
Vigil, Gaery, Granger, & Flinn, 2010	Natural disaster ( $N = 115$ ) Adolescence Mixed gender ( $F = 61.7\%$ )	2 groups (Exposed vs. controls)	$r = -.23^*$ between self-esteem and traumatic stress Lower self-esteem in males
Adewuya et al., 2009	HIV-stigma ( $N = 190$ ) Adulthood Mixed gender ( $F = 54.7\%$ )	1 group	Self-esteem, past traumatic events, social support and general psychopathology predict PTSD
Boscarino & Adams, 2009	Terrorist attack ( $N = 2368$ ) Adulthood Mixed gender ( $F = 53.8\%$ )	1 group	Gender, ethnicity, self-esteem, negative life events, trauma exposure, lifetime traumatic events, handedness and depression predict PTSD
Li et al., 2009	Various potentially traumatic events ( $N = 1625$ ) Childhood Mixed gender ( $F = 49\%$ )	3 groups (AIDS orphans vs. vulnerable children vs. controls)	$r = .00$ to $-.08$ between self-esteem and trauma exposure scales occurrence, density, duration of impact, initial impact, lasting impact No gender differences regarding self-esteem
Al-Turkait & Ohaeri, 2008	Military men ( $N = 200$ ) Adulthood Male	4 groups (Retired vs. active-in-army vs. involved-in-combat vs. prisoners of war)	$r = -.39^{***}$ between self-esteem and traumatic stress Lower self-esteem in individuals with PTSD vs. no PTSD
David, Ceschi, Billieux, & van der Linden, 2008	Various potentially traumatic events ( $N = 132$ ) Early adulthood Mixed gender ( $F = 88\%$ )	1 group	$r = -.13$ between self-esteem and traumatic events Self-esteem does not mediate relation between traumatic events and depression
Klensmeden Fosse & Hølen, 2007	Childhood trauma ( $N = 160$ ) Early adulthood Mixed gender ( $F = 67\%$ )	1 group	$R^2 = .19$ mother overprotection, bullying by peers and childhood sexual abuse predict self-esteem

Table 6 (Continued)

Authors	Sample	Design	Main Finding
Finzi-Dottan & Karu, 2006	Childhood trauma ( $N = 196$ ) Early and middle adulthood Mixed gender ( $F = 66\%$ )	1 group	$r = -.44^{***}$ between self-esteem and emotional abuse $R^2 = .30$ emotional abuse, parental control and maternal care predict self-esteem Self-esteem mediates relation between childhood emotional abuse and adult psychopathology
Kashdan, Uswatte, & Julian, 2006	War ( $N = 77$ ) Adulthood Mixed gender ( $F = 1\%$ )	3 groups (Outpatients vs. residential patients vs. controls)	Trait negative affect and trait gratitude predict self-esteem Lower self-esteem in individuals with PTSD vs. no PTSD
Sumer et al., 2005	Natural disaster ( $N = 350$ ) Adulthood Mixed gender ( $F = 52\%$ )	1 group	$r = -.37^{***}$ between self-esteem and intrusion $r = -.01$ between self-esteem and avoidance $R^2 = .26$ self-esteem and optimism predict self-efficacy $R^2 = .29$ self-esteem, optimism, material loss, perceived threat and gender predict intrusion Lower self-esteem in females
Langeveld, Grootenhuis, Voute, de Haan, & van den Bos, 2004	Childhood cancer ( $N = 960$ ) Early and middle adulthood Mixed gender ( $F = 50.8\%$ )	2 groups (History of cancer vs. controls)	$R^2 = .08$ to $.37$ self-esteem, gender, unemployment and health problems predict quality of life dimensions No difference in self-esteem in individuals with and without trauma exposure
Stein, Burden Leslie, & Nyamathi, 2002	Childhood trauma ( $N = 581$ ) Early and middle adulthood Female	1 group	Lower self-esteem in females $r = -.18^{***}$ between self-esteem and childhood trauma Self-esteem mediates relation between childhood trauma and adult depression/substance abuse
Feiring, Taska, & Lewis, 1998	Sexual abuse ( $N = 142$ ) Childhood/adolescence Mixed gender ( $F = 76.1\%$ )	2 groups (Children vs. adolescents)	$r = -.22^{**}$ between self-esteem and number of traumatic events $R^2 = .31$ age, number of abusive events, attributional risk and shame predict self-esteem
Lynch & Cicchetti, 1998	Childhood trauma ( $N = 322$ ) Childhood Mixed gender ( $F = 37.3\%$ )	2 groups (Maltreated vs. controls)	No gender differences regarding self-esteem $R^2 = .20$ age, victimization by violence and parental neglect predict self-esteem Lower self-esteem in maltreated vs. non-maltreated children
Bunce, Larson, & Peterson, 1995	Various potentially traumatic events ( $N = 58$ ) Early adulthood Mixed gender ( $F = 69\%$ )	1 group	No gender differences regarding self-esteem Lower self-esteem in individuals with traumatic stress vs. no traumatic stress
Fox & Gilbert, 1994	Physical abuse ( $N = 253$ ) Early adulthood Female	1 group	Significant $r$ (not reported) between self-esteem and physical abuse

Note: <sup>1</sup>Trauma type not specified; gender, F=female; childhood/adolescence = 0–21 years; early adulthood = 22–40 years; middle adulthood = 41–60 years; adulthood = from early to old adulthood (>60 years); \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 7.** Impulsivity: cross-sectional findings

Authors	Sample	Design	Main Finding
Narvaez et al., 2012	Childhood trauma ( $N=84$ ) Early adulthood Mixed gender ( $F=8\%$ )	1 group	Hedges effect size $g=.81$ between impulsivity and childhood trauma
Fishbein et al., 2009	Childhood trauma ( $N=553$ ) Childhood Mixed gender ( $F=52\%$ )	1 group	No significant $r$ (not reported) between impulsivity and traumatic distress
Moehler et al., 2009	Childhood trauma ( $N=119$ ) Adulthood (not specified) Female	2 groups (Abused vs. controls)	Significant $r$ (not reported) between impulsivity and childhood trauma
Ariga et al., 2008	Various potentially traumatic events ( $N=64$ ) Adolescence Female	1 group	No significant $r$ (not reported) between impulsivity and traumatic distress
Ledgerwood & Petry, 2006	Childhood trauma ( $N=149$ ) Middle adulthood Mixed gender ( $F=52\%$ )	2 group (Low vs. high PTSD)	Significant $r$ (not reported) between impulsivity and childhood trauma
Willebrand, Kildal, Andersson, & Ekselius, 2002	Burn accident ( $N=166$ ) Middle adulthood Mixed gender ( $F=20.5\%$ )	1 group	Higher impulsivity in individuals with traumatic stress vs. no traumatic stress
Brodsky et al., 2001	Childhood trauma ( $N=136$ ) Early adulthood Mixed gender ( $F=64\%$ )	2 groups (Abused vs. controls)	Impulsivity does not mediate relation between childhood trauma and adult suicidality Higher impulsivity in individuals with traumatic stress vs. no traumatic stress
Kotler, Iancu, Efroni, & Amir, 2001	Various potentially traumatic events ( $N=46$ ) Middle adulthood Mixed gender ( $F=24\%$ )	3 group (PTSD vs. anxiety disorder vs. controls)	$R^2=.58$ impulsivity and social support predict suicide risk
Zlotnick et al., 1997	Childhood trauma ( $N=85$ ) Adulthood Mixed gender ( $F=42\%$ )	1 group	Significant $r$ (not reported) between impulsivity and childhood trauma

*Note:* Gender, F = female; childhood/adolescence = 0–21 years; early adulthood = 22–40 years; middle adulthood = 41–60 years; adulthood = from early to old adulthood (> 60 years).

relationship between self-esteem and posttraumatic stress symptoms (e.g., Al-Turkait & Ohaeri, 2008; Li et al., 2009), indicating that subjects with higher self-esteem experience traumatic stress to a lesser extent. In addition, several studies have reported significant negative associations between self-esteem and childhood adversities (e.g., Stein et al., 2002; Vigil et al., 2010), with the highest negative association found between childhood emotional abuse/emotional neglect and self-esteem (Finzi-Dottan & Karu, 2006; Kuo et al., 2011). Three studies examined a mediation model regarding self-esteem, with two studies finding that childhood adversities had an indirect effect on adult psychopathology, as mediated by self-esteem (Finzi-Dottan & Karu, 2006; Stein et al., 2002), and one study finding no mediation of self-esteem on the relationship between traumatic events and depression (David et al., 2008). The results regarding group differences are

mixed, with half of the studies finding group differences in self-esteem between individuals with and without PTSD. From a methodological perspective, these results may be misleading. Many researchers have pointed out that group comparisons originating from dichotomization of a variable (e.g., low and high self-esteem) can lead to false interpretations due to a loss in variance and analytical power (Cohen, 1983; DeCoster, Iselin, & Gallucci, 2009). Considering this issue, it is not compellingly evident that individuals with high self-esteem really experience fewer traumatic symptoms.

### **Impulsivity/self-control**

The cross-sectional findings are illustrated in Table 7.

The findings primarily suggest a significant relationship between childhood trauma and impulsivity among adults (Brodsky et al., 2001; Moehler et al., 2009;



Narvaez et al., 2012; Zlotnick et al., 1997), although this has not been found in child samples (Ariga et al., 2008; Fishbein et al., 2009). Unfortunately, most of the studies did not report a correlation coefficient, so it is impossible to make statements about the strength of the relationship. There is some evidence in that some studies show participants with a traumatic experience show higher impulsivity than controls (Brodsky et al., 2001; Willibrand et al., 2002). This may also be explained by variance differences in correlational versus group comparison designs. Furthermore, one study failed to confirm the mediating role of impulsivity on the relationship between abusive experiences in childhood and later suicidality in adults with major depression (Brodsky et al., 2001).

### Gender effects

With regard to gender effects, few studies have assessed differences between male and female participants. With regard to self-efficacy, two studies (Benight & Harper, 2002; Sumer et al., 2005) have found that women report lower self-efficacy than men, whereas one study did not find any gender differences (Benight et al., 2008). Gender differences were examined in only one study assessing locus of control, which found that boys externalize to a higher extent than girls (Kuterovac-Jagodic, 2003). Inconsistent results have emerged regarding the concept of self-esteem as well. In studies with children, the level of self-esteem seems to be equal among girls and boys (Feiring et al., 1998; Li et al., 2009; Lynch & Cicchetti, 1998). Studies of young adults, however, have found lower levels of self-esteem in women (Langeveld et al., 2004; Sumer et al., 2005), although one study of adolescents found that males reported lower self-esteem than females (Vigil et al., 2010). Finally, none of the studies on impulsivity tested gender effects.

### Discussion and future directions

Taken together, the majority of the longitudinal studies reviewed here suggest that self-efficacy is a robust predictor of the extent or severity of posttraumatic stress in adulthood. The strongest associations between traumatic stress and motivational constructs were found for self-efficacy, followed by self-esteem and locus of control with approximately equally strong relations, and, finally, relatively inconsistent associations with impulsivity. This may reflect a continuum of the most- versus least-involved motivational processes in traumatization. Self-efficacy would, therefore, be the most powerful motivational component that is involved in the development of traumatic symptoms.

Our review supports the findings of Luszczynska et al. (2009) regarding the relationship between self-efficacy and traumatic distress. Due to a lack of research, we did not find evidence that traumatic stress affects self-efficacy.

From a theoretical perspective, self-efficacy beliefs are determined by mastery experience (e.g., success raises self-efficacy), vicarious experience (e.g., success is produced by models), verbal persuasions (e.g., verbal judgments by others), and physiological states (e.g., anxiety and stress) (Bandura, 1997). Consequently, we hypothesize that experiencing posttraumatic stress would damage self-efficacy. However, the empirical evidence for this assumption is still lacking. In the literature reviewed, only three longitudinal studies investigated the development of self-efficacy and suggested that self-efficacy remains stable after a traumatic exposure. However, two of the three studies examined professional samples after a collective trauma (i.e., firefighters and soldiers) and one study assessed victims with an individual trauma (i.e., non-domestic violence). One possible explanation for this phenomenon is that the type of trauma experienced influences the level to which self-efficacy changes. Therefore, we would assume that individual traumas, especially man-made, exert the highest impact on self-efficacy.

The small to moderate and, in some studies, even absent association between locus of control and posttraumatic stress is surprising. Our main assumption was that perceiving uncontrollability would be associated with more PTSD symptoms. One explanation for the unexpected findings may be linked to the debate on self-blame (Davis, Lehman, Silver, Wortman, & Ellard, 1996) or on counterfactual thinking (Leithy, Brown, & Robbins, 2006) in trauma victims. For example, a rape victim's belief that he or she could have avoided the event by having acted differently is similar to the perception generated by an internal locus of control, according to which one's own behavior determines the events in one's life. Thus, self-blame or counterfactual thinking may serve as a mediator or moderator in the relationship between locus of control and traumatic stress. For this reason, future studies should further investigate the role of controllability in the trauma context.

One reason for the weak association between self-esteem and posttraumatic stress might lie in the understanding of the construct of self-esteem. Crocker and Park (2004) discussed the costs and benefits of pursuing self-esteem and concluded that pursuing self-esteem is only beneficial if the advantages pre-dominate the efforts. In other words, it is essential to detect what goals individuals are striving for to show to themselves and others that they are valuable and worthy people. The trauma research has primarily focused on the level of self-esteem. Consequently, it may be that pursuing self-esteem, or pursuing goals to achieve self-esteem, is more important than just the level of self-esteem in traumatized individuals.

The inconsistent findings regarding impulsivity in trauma victims are, in a way, not surprising. Given the fact that literature on impulsivity in trauma victims has

often considered samples who suffer from a comorbid disorder (e.g., substance abuse or borderline personality disorder), it is possible that the association between trauma and impulsivity is confounded by other factors related to a concurrent psychiatric disorder (Marshall-Berenz, Vujanovic, & MacPherson, 2011). In the trauma literature, impulsivity has also frequently been studied together with anger (e.g., Chemtob, Hamada, Roitblat, & Muraoka, 1994). However, these two concepts seem to be independent of each other. Given that impulsivity is seen as the opposite of self-control, studying self-control in the context of traumatization would be another promising approach.

With the exception of self-esteem, we found only a few studies that treat self-efficacy, locus of control, and impulsivity as dependent variables after a traumatic event. According to the model of shattered assumptions (Janoff-Bulman, 1992), after a traumatic event, individuals may perceive the world as being hostile and meaningless and the self as being damaged and worthless. More recent models of PTSD emphasize the importance of such dysfunctional thoughts and attitudes in trauma victims, as these may hinder their recovery from the disease (Ehlers & Clark, 2000; Foa & Rothbaum, 1999).

Given that a considerable amount of research has provided evidence for the positive impact of motivation on mental health (Forstmeier & Maercker, 2008; Heckhausen, Wrosch, & Schulz, 2010), it is of particular importance to know whether and how traumatic stress impacts motivation. Future research is required to shed light on such mechanisms.

In accord with the findings reported by Luszczynska et al. (2009), we conclude that the role of motivational variables as mediators or moderators remains unclear. First, very few studies have examined this relationship. Second, the predictor and criteria variables differed across the studies. The studies reviewed here examined the mediation hypothesis, that is, whether individuals who have survived traumatic events also tend to report lower motivation, which, in turn, has an impact on the development of psychopathology. Due to contradictory results from existing studies, more research is needed to clarify these processes.

Compared with the other three constructs, self-esteem has been investigated more frequently in younger populations. Of particular interest is the finding that associations between traumatic stress and self-esteem in children and adolescents are considerably weaker than those same relationships in adults. This difference may be a result of the various types of trauma (e.g., maltreatment in children vs. war combat in adults) or may be due to comparably higher resilience in children (Masten, 2007). Another possibility has its origins in developmental psychology and argues that children may process traumatic contents differently than adults, which leads to

differing characteristics of PTSD (Maercker, Michael, Fehm, Becker, & Margraf, 2004; Pynoos, Steinberg, & Piacentini, 1999). Thus, the impact of a traumatic event might have more serious damage in adulthood than in childhood due to the more advanced development of motivations, cognitions, emotions, and behaviors in adults. The difference between adults and children may further be due to biased self-reports in maltreated young and very young participants (Eisen, Goodman, Qin, Davis, & Crayton, 2007).

Very few studies have tested gender effects, and those that have offer ambiguous findings. Studies with traumatized children report comparable levels of self-esteem in girls and boys. There is evidence that self-esteem in children is generally high for both genders. Given that self-esteem develops parallel to cognitive maturation, it declines during adolescence and gender divergences become more salient (Robins & Trzesniewski, 2005). Research suggests that the small significant gender difference in self-esteem in adults may be due to different sources that are important for self-esteem in women and men (Kling, Shibley Hyde, Showers, & Buswell, 1999). Therefore, it is possible that in the trauma context, as for self-efficacy, the trauma type influences a change in self-esteem. This may also be true for the full range of motivation-related constructs. However, similar to Luszczynska et al. (2009), statements about the magnitude of gender effects in self-efficacy, locus of control, self-esteem, and impulsivity cannot be made from our literature review.

### *Limitations of existing research*

In summary, studies examining the role of motivational concepts in trauma research use different samples, trauma types, study designs, and measuring instruments. Thus, a direct comparison of the results from these heterogeneous data is complicated. One reason for the inconsistency in results could be the angle from which different studies view the relationship between trauma exposure and motivational variables. For example, in the context of stressful life events, the association between situation-specific measures and an outcome tend to be stronger compared with the relationship between general measures and an outcome (Frazier et al., 2011). Given this difference, a comparison of the reviewed studies' findings is further complicated by the factors, such as self-efficacy, that are used as general and situation-specific variables.

In the majority of the studies, young adults and children were the most frequently examined subjects. With regard to the other end of the lifespan, only two studies considered self-efficacy and locus of control in an elderly sample. Not only has research neglected the occurrence of posttraumatic stress in older populations, but it has also ignored the development of a

delayed-onset of this disorder (Averill & Beck, 2000). Given evidence that PTSD may increase the risk for dementia (Yaffe et al., 2010) and that motivational variables predict memory performance in older adults (Forstmeier & Maercker, 2008; Valentijn et al., 2006), it is of great importance to discover the mechanisms that operate between traumatic experiences and motivation.

With the exception of studies on impulsivity, which only focused on individual traumas, studies with the three other constructs examined both collective and individual traumas. Regardless of the type of trauma, no differences concerning the relationship between traumatic stress and motivational factors were found. Even the same type of trauma (e.g., man-made or accidental) does not seem to generate an obvious pattern concerning the association between trauma exposure and motivation-related outcomes. This question remains to be answered.

Finally, expectancy beliefs that have an impact on goal pursuit are underrepresented as outcome variables in the trauma research. In accord with empirical evidence that personally meaningful goals have a beneficial effect on well-being (Brunstein et al., 1999), it seems essential to know the influence of traumatic stress on motivation.

### Future directions

Recent research provides evidence that self-efficacy is considered to be one of the central factors in attaining posttraumatic recovery (Benight & Bandura, 2004; Benight, Ruzek, & Waldrep, 2008). Accordingly, promoting self-efficacy would contribute to encouraging individuals with trauma exposure to dare to engage in less avoidance and explore potentially corrective experiences. Furthermore, attributional elements of the motivational constructs should be included in treatments with trauma victims. Several studies suggest that the helplessness concept has proven itself a useful model in the context of PTSD. That is, more PTSD symptoms seem to be related to a more pronounced disadvantageous attributional style (Elwood, Hahn, Olatunji, & Williams, 2009; McKeever, McWhirter, & Huff, 2006; McCormick, Taber, & Kruegelbach, 1989; Palker-Corell & Marcus, 2004). Moreover, there are some indices that individuals with trauma exposure face difficulties when they engage in goal-directed behavior in stressful situations (Weiss et al., 2012). Therefore, applying more favorable attributional style patterns may lead to improved motivation (e.g., by stimulating approach motivation) and, in turn, to better recovery from PTSD. The concept of approach and avoidance motivation, which has primarily been studied in motivational psychology, should be incorporated into future trauma research (Elliot, 2008; Grawe, 2007). Approach-motivated individuals show behavioral tendencies that are directed by a desirable event, which serves to need satisfaction. In contrast, individuals who pursue avoidance goals are primarily motivated to avoid need

frustration. Avoidance motivation is very pronounced in trauma victims. Therefore, it is necessary to include motivational components in the treatment of trauma sequelae.

Finally, the cognitive processing therapy for PTSD (Resick & Schnicke, 1992), which has been proven effective in several studies (Monson et al., 2006; Resick et al., 2008), includes inter alia the challenging of over-generalized beliefs in different areas, such as safety, trust, power, control, esteem, and intimacy. The motivational constructs discussed here (e.g., self-efficacy, locus of control, and impulsivity) can be linked to maladaptive thoughts about control and esteem (e.g., self-esteem). Therefore, changing such dysfunctional convictions can help individuals to successfully recover from a trauma.

### Conclusion

To conclude, we summarized and discussed the literature on motivation (self-efficacy, locus of control, self-esteem, and impulsivity) in individuals with a history of trauma. The existing research on the relation between traumatic stress and motivation faces some challenges. First, it is clear that more studies with longitudinal designs are needed. Presently, the majority of longitudinal studies in this area have tested the role of self-efficacy in the trauma context. It is desirable to have longitudinal studies that examine the effects of additional motivational constructs as well. Second, motivation-related constructs should be considered as outcome variables more frequently. Studies should investigate whether trauma exposure leads to a change in these variables. Third, the role of motivation as a mediator or moderator should be included in future analyses. Fourth, more studies of old-aged individuals are required, so that a perspective regarding the entire life span can be provided. Fifth, the stabilizing and strengthening of personal expectancies (i.e., self-efficacy, locus of control, and self-esteem) and self-control in trauma victims should become the main goal of treatment programs, as these are essential for goal setting and goal implementation, which are of great importance for individual well-being and life adjustment.

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There is no conflict of interest in the present study for any of the authors.

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# Traumata, Entwicklungsperioden und motivationale Fähigkeiten bei Schweizer Verdingkindern im Alter

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## Summary

*Trauma, developmental stages, and motivational abilities in indentured Swiss child laborers in old age*

**Objectives:** The study examined the relationship between potential traumatic events in childhood and motivational abilities in old adulthood according to developmental stage.

**Methods:** The motivational abilities of self-efficacy, conscientiousness and impulsivity (self-control) were investigated in a sample of 114 formerly indentured Swiss child laborers. Adversities were assessed by the Childhood Trauma Questionnaire (CTQ). The sample was split into four age groups according to the beginning of the potential trauma: infancy (0–2), preschool (3–5), early childhood (6–9), and early adolescence ( $\geq 10$ ).

**Results:** The strongest relationship was found between self-efficacy and CTQ in the group “early adolescence,” followed by the relationship between conscientiousness and CTQ in the same group. Impulsivity and CTQ were most strongly associated in the “preschool” group.

**Conclusion:** Childhood adversities seem to have a negative impact on self-efficacy and conscientiousness after the age of ten. In contrast, self-control seems to be affected by the deleterious effect of trauma or adversity already at an earlier age.

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## Keywords

Childhood Trauma – Motivational Abilities – Self-Efficacy – Conscientiousness – Impulsivity – Self-Control – Developmental Stages

## Zusammenfassung

**Fragestellung:** Die Studie untersucht in Abhängigkeit entwicklungspsychologischer Stadien die Beziehung zwischen potentiell traumatischen Erfahrungen in der Kindheit und den aktuellen motivationalen Fähigkeiten im höheren Lebensalter.

**Methode:** Die motivationalen Fähigkeiten Selbstwirksamkeit, Gewissenhaftigkeit und Impulsivität (Selbstkontrolle) wurden bei 114 ehemaligen Schweizer Verdingkindern erhoben. Zur Erfassung der potentiellen Traumafaktoren wurde der Childhood Trauma Questionnaire (CTQ) eingesetzt. Die Stichprobe wurde in vier Altersgruppen, in denen die Erstverdingung begann, unterteilt: Säuglingsalter (0–2), Vorschulalter (3–5), frühe Kindheit (6–9) und frühe Adoleszenz ( $\geq 10$ ).

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**Ergebnisse:** Die stärkste Beziehung war zwischen Selbstwirksamkeit und dem CTQ-Gesamtwert in der Altersgruppe der Frühadoleszenten zu finden. Danach folgte der Zusammenhang zwischen Gewissenhaftigkeit und dem CTQ-Gesamtwert in der gleichen Altersgruppe. Schließlich waren Impulsivität und der CTQ-Gesamtwert in der Gruppe Vorschulalter am stärksten assoziiert.

**Diskussion:** Potentielle Traumafaktoren scheinen die Selbstwirksamkeit und Gewissenhaftigkeit ab dem zehnten Lebensjahr negativ zu beeinflussen. Die Selbstkontrolle scheint jedoch schon im früheren Alter dem schädlichen Einfluss aversiver Erfahrungen zu unterliegen.

## 1. Hintergrund

Die vorliegende Studie untersucht die Folgen aversiver oder traumatischer Erfahrungen in der Kindheit auf motivationale Fähigkeiten im höheren Lebensalter. Zunächst wird die besondere Untersuchungspopulation der Schweizer Verdingkinder vorgestellt. Anschließend werden psychische Langzeitfolgen im höheren Lebensalter aus lebensspannenpsychologischer Perspektive beschrieben. Motivationale Langzeitfolgen stehen danach im Mittelpunkt.

Das Phänomen „Verdingkindwesen“ fand bis in die 1970er Jahren in der Schweiz statt und repräsentiert ein dunkles Kapitel Schweizer Geschichte. Zehntausende Kinder in jedem Alter, die entweder unehelich geboren wurden, verwaist waren oder aus zerrütteten Familienverhältnissen stammten, wurden durch die Behörden fremdplatziert (Leuenberger u. Seglias 2008). Diese ehemaligen „Verdingkinder“ waren weitgehend in Bauernfamilien oder Kinderheimen untergebracht, lebten in sehr armen Verhältnissen und mussten für ihren Lebensunterhalt harte Arbeit verrichten. Die meisten von ihnen erlebten zahlreiche aversive oder traumatische Erfahrungen. Die vorliegende Studie wurde mit den noch Lebenden mit solchen Lebensgeschichten durchgeführt, die inzwischen ihr höheres Erwachsenenalter erreicht haben.

Schwerwiegende Kindheitserfahrungen (nachfolgend zusammengefasst als „aversive oder traumatische Erfahrungen“ bzw. „potentielle Traumafaktoren“) führen häufig zu ernsthaften Veränderungen in der psychischen Gesundheit in späteren Lebensphasen (Kiecolt-Glaser et al. 2011), wobei die Langzeitfolgen für das hohe Erwachsenenalter weniger gut untersucht sind. Einige Befunde zeigen, dass in älteren Populationen frühe aversive Erfahrungen mit einem höheren Risiko für psychische Störungen zusammenhängen (Kessler et al. 2010) oder eine Trauma-Reaktivierung bewirken können (Heuft 1999). Beispielsweise verdeutlichte eine Studie mit Kindern, die während des Zweiten Weltkriegs evakuiert und von ihren Ursprungsfamilien getrennt wurden, den negativen Einfluss aversiver Kindheitserlebnisse auf das psychische Wohlbefinden auch Jahrzehnte später (Rusby u. Tasker 2009).

Darüber hinaus stellt sich die Frage, ob aversive oder traumatische Erfahrungen die motivationalen Fähigkeiten einer Person verändern. Motivation beinhaltet psychische Prozesse, die in zielstrebiges Verhalten involviert sind und zwei wichtige Aspekte umfassen, nämlich Zielverfolgung und -implementierung (Bargh et al. 2010). Selbstwirksamkeit (Bandura 1997) und Gewissenhaftigkeit (John u. Srivastava 1999)

spielen bei der Erreichung von Zielen eine wichtige Rolle. Impulsivität hingegen macht die Zielimplementierung eher unwahrscheinlicher (Hagger et al. 2010).

Die Berücksichtigung der Entwicklungsperspektive bringt in Zusammenhang mit Traumafolgestörungen weiteren Aufschluss (Maercker et al. 2004). Ein traumatisierungsbezogenes, entwicklungspsychopathologisches Modell von Pynoos et al. (1999) fasst in einer Matrix intrinsische Faktoren, Entwicklungsstufen und Erfahrungen, Lebensereignisse sowie familiäre und soziale Umwelten zusammen, die die Folgen einer Traumatisierung beeinflussen. In diesem Modell wird der Entwicklung des subjektiven Bewertungs- und Interpretationssystems traumatischer Geschehnisse eine zentrale Rolle zugeschrieben. In den ersten Lebensjahren erfolgt die Einschätzung der Gefahr aufgrund der sozialen Referenz bei Bezugspersonen, wohingegen Kinder ab dem Schulalter ein größeres Verständnis für Bedrohungen entwickeln und sich auf ihr eigenes Bewertungssystem verlassen. Aversive oder traumatische Erfahrungen können die Erwartungen über die Welt, Sicherheit oder die Zukunft, die sich im Kindesalter festigen, verzerren und die weitere Entwicklung negativ beeinflussen.

Die „Verdingkind-Studie“ erlaubt es, entwicklungspsychologische Stadien zu unterscheiden, in denen die potentielle Traumatisierung begann: Säuglingsalter (0–2 Jahre), Vorschulalter (3–5 Jahre), frühe Kindheit (6–9 Jahre) und frühe Adoleszenz (≥ 10 Jahre). Die Leitfrage der vorliegenden Studie ist: Sind in den vier Verdingungsaltersgruppen hinsichtlich des Zusammenhangs zwischen aversiver oder traumatischer Erfahrungen und motivationaler Fähigkeiten bestimmte Alterstrends erkennbar? Weiterhin stellt sich die Frage, ob sich die motivationalen Fähigkeiten unterscheiden, je nachdem, in welcher Entwicklungsphase der Beginn der aversiven Erfahrungen stattfand. In Anlehnung an Pynoos et al. (1999) wird angenommen, dass ein späteres Alter bei Beginn der Verdingung mit einer niedrigeren Selbstwirksamkeit einhergeht. Hingegen ist anzunehmen, dass ein frühes Alter bei der Verdingung mit einer geringeren Selbstkontrolle und damit höheren Impulsivität assoziiert ist, weil die potentiell traumatischen Erlebnisse die Entwicklung der Selbstkontrolle verhindern oder stark beeinträchtigen (Steinberg 2007). Für Gewissenhaftigkeit wäre ähnliches zu erwarten, bisher gibt es allerdings in diesem Zusammenhang noch keine empirischen Hinweise, was dieser Studie einen explorativen Charakter verleiht.

## 2. Methode

Die vorliegende Studie ist Teil einer umfangreichen Erhebung (Burri et al. 2013; Krammer et al. 2013) und der erste Untersuchungszeitraum einer geplanten Längsschnittstudie.

### 2.1. Durchführung

Die Stichprobe wurde durch Anzeigen und Aufrufe in Printmedien, einer Fernsehsendung und über Weiterempfehlung der bereits befragten Studienteilnehmenden rekrutiert. Auswahlkriterien waren ein Alter ≥ 70 Jahre, gute Deutschkenntnisse so-

wie eine Verdingung während der Kindheit oder Jugendzeit. Die Interviews dauerten zwischen zwei und drei Stunden und fanden entweder am Psychologischen Institut der Universität Zürich oder bei den Betroffenen zuhause statt. Nachdem das Ziel und der Inhalt der Studie erklärt wurden, unterzeichneten die Befragten eine Einverständniserklärung. Anschließend erhielten die Studienteilnehmenden eine zusätzliche Fragebogenbatterie, die sie selbstständig ausfüllten. Als Entschädigung wurden die Anreisekosten zurückerstattet.

## 2.2. Stichprobe

In Tabelle 1 sind die deskriptiven Daten von 114 (38.6 % weiblich) ehemaligen Verdingkindern aufgesplittet nach Altersgruppen dargestellt. Zum Zeitpunkt der Erstverdingung waren die Kinder im Schnitt 5.73 (SD = 4.40) Jahre alt. Sie lebten durchschnittlich bei 3.0 (SD = 2.5) verschiedenen Familien nacheinander und waren über 10.8 (SD = 5.2) Jahre fremdplatziert.

Bei der Befragung betrug das Durchschnittsalter 77.6 (SD = 7.0) Jahre. 38.6 % waren verheiratet und 46.5 % lebten alleine. Abgesehen vom Alter bei der Befragung und der Dauer der Verdingzeit ergaben sich keine statistisch signifikanten Unterschiede zwischen den vier Altersgruppen.

## 2.3. Messinstrumente

*Potentielle Traumafaktoren:* Zur Erfassung der Intensität und Art der aversiven sowie traumatischen Erfahrungen während der Kindheit und Jugendzeit wurde die Kurzform des *Childhood Trauma Questionnaires* (CTQ; Bernstein et al. 2003; dt.: Gast et al. 2001) eingesetzt. Mit diesem Instrument werden emotionaler, körperlicher und sexueller Missbrauch sowie emotionale und körperliche Vernachlässigung erfragt. Es umfasst 25 Items, die auf einer fünfstufigen Likert-Skala (von 1 = überhaupt nicht bis 5 = sehr häufig) beantwortet werden. Für die fünf Subskalen ergibt sich ein Wertebereich von mindestens fünf und maximal 25 Punkten, wobei höhere Werte einer höheren Belastung entsprechen. Es wurden die von Bernstein et al. (2003) vorgeschlagenen klinisch relevanten Cut-Off-Werte verwendet:  $\geq 8$  für sexuellen Missbrauch (CTQ-SM),  $\geq 10$  für körperlichen Missbrauch (CTQ-KM),  $\geq 10$  für körperliche Vernachlässigung (CTQ-KV),  $\geq 13$  für emotionalen Missbrauch (CTQ-EM),  $\geq 15$  für emotionale Vernachlässigung (CTQ-EV) und  $\geq 56$  für den Gesamtwert (CTQ-Gesamtwert). Für den CTQ-Gesamtwert ergab sich ein Cronbachs  $\alpha$  von .89. Für die Subskalen erhielten wir Werte von .96 für CTQ-SM, .89 für CTQ-KM, .85 für CTQ-EV, .78 für CTQ-EM und .33 für CTQ-KV.

*Motivationale Fähigkeiten: Selbstwirksamkeit* wurde mit der eindimensionalen Skala zur Allgemeinen Selbstwirksamkeitserwartung (SWE; Schwarzer u. Jerusalem 1999) bestehend aus zehn Items mit einer vierstufigen Likert-Skala (von 1 = stimmt nicht bis 4 = stimmt genau) erhoben. Die interne Konsistenz erreichte ein Cronbachs  $\alpha$  von .90.

*Gewissenhaftigkeit* wurde mit der deutschen Kurzversion (Körner et al. 2008) der Gewissenhaftigkeitssubskala des *NEO Five Factor Inventory* (NEO-GEW; McCrae u. Costa 2004) erhoben. Die sechs Items wurden auf einer fünfstufigen Likert-Skala

Tabelle 1: Stichprobenbeschreibung für die Gesamtgruppe und Teilgruppen nach Alter bei Erstverdingung

	Gesamtgruppe		Säuglingsalter		Vorschulalter		Frühe Kindheit		Frühe Adoleszenz		Test für Teilgruppen
	N = 114		n = 32		n = 25		n = 29		n = 28		
	M	SD	M	SD	M	SD	M	SD	M	SD	F/ $\chi^2$
Alter bei Befragung (Jahre)	77.6	7.0	74.3	6.9	77.9	6.0	78.9	7.6	79.6	6.3	3.64*
Bildung (Jahre)	10.5	2.9	11.1	3.3	10.8	2.3	9.8	2.4	10.3	3.3	1.06
Dauer der Verdingung (Jahre)	10.8	5.2	16.9	3.3	12.4	2.1	8.2	2.3	5.4	2.5	111.28***
Anzahl Pflegefamilien	3.0	2.5	3.5	2.6	3.5	3.0	2.6	2.2	2.3	1.8	1.90
	%		%		%		%		%		
Geschlecht (Frauen)	38.6		53.1		44.0		20.7		35.7		7.18 <sup>#</sup>
Zivilstand											9.03
Ledig	6.1		12.5		4.0		0.0		7.1		
Verheiratet	38.6		40.6		48.0		31.1		35.7		
Getrennt/Geschieden	25.4		25.0		28.0		24.1		25.0		
Verwitwet	29.8		21.9		20.0		44.8		32.2		

Anmerkung. \* $p < .05$ , \*\*\* $p < .001$ , # $p < .10$ . Kontraste: Alter bei Befragung  $1 < 4$ ; Dauer der Verdingung  $1 > 2$ ,  $1 > 3$ ,  $1 > 4$ ,  $2 > 3$ ,  $2 > 4$ ,  $3 > 4$ .

(von 0 = starke Ablehnung bis 4 = starke Zustimmung) beantwortet. Die interne Konsistenz betrug .68.

Für die Erhebung der *Impulsivität* wurde die Kurzversion (Spinella 2007) der *Barratt Impulsiveness Scale* (BIS; Patton et al. 1995) verwendet, die 15 Items umfasst, die auf einer vierstufigen Likert-Skala (von 1 = selten/nie bis 4 = fast immer/immer) beantwortet werden. Cronbachs  $\alpha$  betrug .63.

## 2.4. Statistische Analysen

Für Gruppenvergleiche wurden Varianzanalysen, Kruskal-Wallis-Varianzanalysen für Rangdaten und Kreuztabellen verwendet. Lineare Zusammenhänge wurden mit Pearson-Korrelationskoeffizienten überprüft. Um die Beziehungen zwischen den Variablen vergleichen zu können, wurden alle Korrelationen in Fisher-Z-Werte transformiert und 95 %-Konfidenzintervalle berechnet (Bortz 2005, S. 211). Schließlich wurden hierarchische lineare Regressionen durchgeführt. Im ersten Schritt wurden die Kontrollvariablen Geschlecht und Verdingdauer berücksichtigt. Im zweiten Schritt wurde der CTQ-Gesamtwert ins Modell integriert. Im letzten Schritt wurden drei unabhängige Dummy-Variablen ins Modell eingefügt, um den Einfluss der verschiedenen Altersgruppen bei der Erstverdingung auf die motivationalen Fähigkeiten zu testen. Da der Vergleich der älter Verdingten mit den jünger Verdingten zu überprüfen war, wurde die Altersgruppe der Frühadoleszenten ( $\geq 10$ ) als Referenzgruppe genommen (entspricht einem Wert von 0) und jeweils mit Säuglingsalter, früher Kindheit und Vorschulalter verglichen.

## 3. Ergebnisse

### 3.1. Potentielle Traumafaktoren

81.6 % der Befragten gaben an, in klinisch hohem Ausmaß mit aversiven oder sogar traumatischen Erfahrungen konfrontiert worden zu sein, wobei der höchste Mittelwert bei der emotionalen Vernachlässigung zu finden war. 52.6 % berichteten sexuellen Missbrauch. Über alle Altersgruppen hinweg gaben die Personen massive Missbrauchs- und Vernachlässigungserfahrungen an (vgl. Tabelle 2). Die CTQ-Gesamtskala sowie die beiden Subskalen CTQ-EM und CTQ-KM weisen signifikante Unterschiede zwischen den Altersgruppen auf, wobei die vor dem zweiten Lebensjahr Verdingten höhere Werte haben als die nachfolgenden Altersgruppen und insbesondere die ab dem zehnten Lebensjahr verdingten Personen.

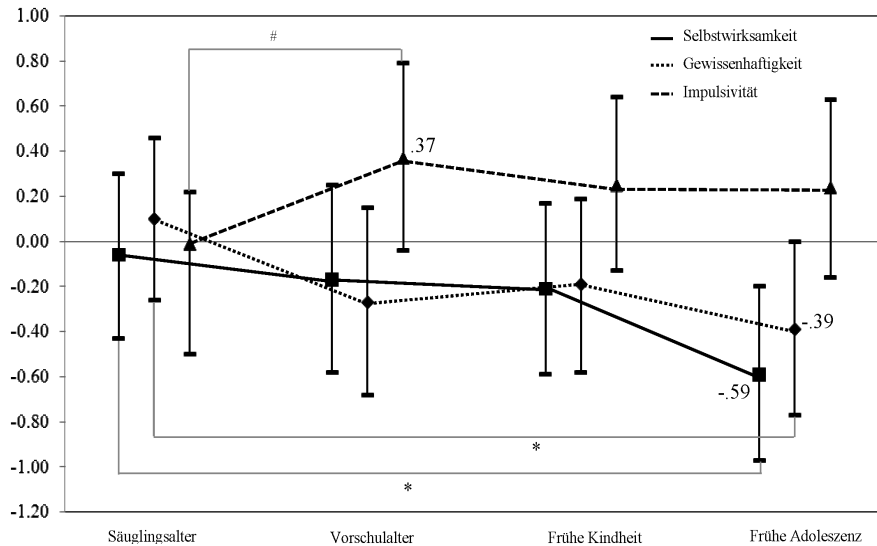
### 3.2. Motivationale Fähigkeiten

Die drei motivationalen Variablen waren ausreichend normalverteilt und hatten Mittelwerte um die jeweiligen Skalenmediane. Über den jeweiligen Medianwerten lagen in der Gesamtstichprobe 56.1 % (Gewissenhaftigkeit), 53.5 % (Selbstwirksamkeit) und 49.1 % (Impulsivität) der Befragten. Im Altersgruppenvergleich ergaben sich

Tabelle 2: Potentielle Traumafaktoren und motivationale Faktoren im Gruppenvergleich des Alters bei Erstverdingung

	Säuglingsalter		Vorschulalter		Frühe Kindheit		Frühe Adoleszenz			
	n = 32		n = 25		n = 29		n = 28			
	M	SD	M	SD	M	SD	M	SD	F	Kontraste
Traumafaktoren										
CTQ-Gesamtwert	78.5	21.5	74.3	19.7	71.3	20.4	65.7	15.5	2.26 <sup>#</sup>	1 > 4
CTQ-EM	16.8	6.1	15.1	4.9	13.3	6.4	12.5	6.0	3.22*	1 > 4
CTQ-KM	15.9	6.9	13.4	6.2	12.0	6.9	9.6	5.7	4.89**	1 > 4
CTQ-SM	10.5	7.3	10.3	6.8	9.3	5.9	8.9	6.3	0.39	–
CTQ-EV	20.9	5.8	20.4	5.3	20.6	5.0	19.9	4.8	0.19	–
CTQ-KV	14.5	4.0	15.2	4.4	16.2	3.7	14.8	3.7	1.11	–
Motivationale Faktoren										
SWE	31.1	5.9	28.1	6.9	30.9	5.3	31.4	5.3	1.77	–
GEW	20.2	3.1	18.8	3.4	19.2	3.3	19.2	3.9	0.90	–
BIS	28.9	5.6	29.3	4.9	29.6	5.6	28.9	6.1	0.17	–

Anmerkung. CTQ-EM: Emotionaler Missbrauch, CTQ-KM: Körperlicher Missbrauch, CTQ-SM: Sexueller Missbrauch, CTQ-EV: Emotionale Vernachlässigung, CTQ-KV: Körperliche Vernachlässigung, SWE: Selbstwirksamkeit; GEW: Gewissenhaftigkeit; BIS: Impulsivität. \*p < .05, \*\*p < .01, <sup>#</sup>p < .10. Effektstärke für emotionalen Missbrauch  $\omega = .24$  und körperlichen Missbrauch  $\omega = .30$ .



Die Altersgruppenzuteilung erfolgt entsprechend dem Verdingalter. Alle Korrelationen sind als Fischers Z-Werte; Testung der Gruppenunterschiede (<http://vassarstats.net/index.html>), Verbindungslinien: #  $p < .10$ , \*  $p < .05$ .

Abbildung 1: Altersvergleich der Korrelationen zwischen potentiellen Traumafaktoren (CTQ-Gesamtwert) und motivationalen Faktoren (mit 95 % Konfidenzintervall; jeweils höchste Korrelationen numerisch eingetragen)

keine bedeutsamen Unterschiede (vgl. Tabelle 2). Bei zusätzlicher Prüfung der Kovariablen CTQ-Gesamtwert, aller CTQ-Subskalen, Geschlecht, Dauer der Verdingzeit und Anzahl Pflegefamilien resultierten ebenfalls keine signifikanten Altersgruppenunterschiede.

### 3.3. Altersgruppen, potentielle Traumafaktoren und motivationale Fähigkeiten

Die Hauptfragestellung betraf die Assoziation zwischen potentiellen Traumafaktoren, motivationalen Fähigkeiten und Erstverdingungsaltersgruppen (vgl. Abb. 1). Auf deskriptiver Ebene lässt sich feststellen:

- der negative Zusammenhang zwischen Selbstwirksamkeit und CTQ-Gesamtwert ist in der Altersgruppe „frühe Adoleszenz“ am größten;
- der negative Zusammenhang zwischen Gewissenhaftigkeit und CTQ-Gesamtwert ist in der Altersgruppe „frühe Adoleszenz“ am größten;
- der positive Zusammenhang zwischen Impulsivität und CTQ-Gesamtwert ist in der Altersgruppe „Vorschulalter“ am größten.

Nachfolgend wurden diese Korrelationen mit Hilfe von Partialkorrelationen auf Einflüsse wichtiger Kovariablen untersucht. Der Zusammenhang zwischen Selbstwirk-

Tabelle 3: Hierarchische Regressionsanalyse zur Vorhersage der Selbstwirksamkeit und Impulsivität (Gewissenhaftigkeit war nicht signifikant)

	Selbstwirksamkeit				Impulsivität			
	B	SE	$\beta$	$\Delta R^2$	B	SE	$\beta$	$\Delta R^2$
Schritt 1				.04				-.01
Geschlecht (0 = w, 1 = m)	2.84	1.12	.24**		-.59	1.07	-.05	
Dauer der Verdingung (Jahre)	0.05	0.11	.04		-.10	0.10	-.10	
Schritt 2				.07				.02
Geschlecht	2.62	1.11	.22*		-.38	1.06	-.03	
Dauer der Verdingung	0.10	0.11	.09		-.16	0.10	-.15	
Potentielle Traumafaktoren (CTQ-Gesamtwert)	-0.06	0.03	-.20*		0.06	0.03	.21*	
Schritt 3				.09				.01
Geschlecht	2.47	1.13	.20*		-.26	1.11	-.02	
Dauer der Verdingung	0.26	0.21	.23		-.32	0.20	-.30	
Potentielle Traumafaktoren (CTQ-Gesamtwert)	-0.06	0.03	-.20*		0.06	0.03	.20*	
Säuglingsalter vs. Frühe Adoleszenz	-2.14	2.83	-.16		2.74	2.76	.22	
Vorschulalter vs. Frühe Adoleszenz	-4.42	2.13	-.31*		2.18	2.08	.16	
Frühe Kindheit vs. Frühe Adoleszenz	-1.33	1.60	-.10		1.36	1.57	.11	

Anmerkung. Selbstwirksamkeit:  $R^2 = .14$ ,  $F(3, 107) = 2.05$ ,  $p = .11$ . Effektstärke  $f^2 = .16$ . Impulsivität:  $R^2 = .06$ ,  $F(3, 107) = 0.42$ ,  $p = .74$ . Effektstärke  $f^2 = .06$ . \* $p < .05$ , \*\* $p < .01$ .



samkeit und CTQ-Gesamtwert bleibt auch nach Kontrolle für Geschlecht, Dauer der Verdingzeit und Anzahl Pflegefamilien bestehen. Der positive Zusammenhang zwischen Impulsivität und CTQ-Gesamtwert verringert sich leicht nach Kontrolle für Geschlecht ( $r = .32, p = .07$ ). Schließlich verringert sich der negative Zusammenhang zwischen Gewissenhaftigkeit und CTQ-Gesamtwert nach Kontrolle für Geschlecht ( $r = -.26, p = .10$ ).

### 3.4. Motivationale Fähigkeiten und Erstverdingungsalter: Multivariate Zusammenhänge

Abschließend wurde multivariat mittels Regressionsanalysen untersucht, ob die über das Erstverdingungsalter definierten Altersgruppen signifikant zur Vorhersage der motivationalen Fähigkeiten beitragen, nachdem für Geschlecht und Dauer der Verdingung kontrolliert wurde.

Wie Tabelle 3 zeigt, war Geschlecht ein wichtiger Prädiktor der Selbstwirksamkeit, bevor andere erklärende Variablen ins Modell integriert wurden. Im zweiten Schritt klärten die potentiellen Traumafaktoren (CTQ-Gesamtwert) weitere Varianz auf. Schritt drei ergab, dass der Altersgruppenvergleich zwischen der dritten (Vorschulalter) und vierten Altersgruppe (frühe Adoleszenz) ein weiterer signifikanter Prädiktor wurde, so dass insgesamt 14 % der Varianz aufgeklärt wurden. Dieses Ergebnis zeigt, dass im Vergleich zu den am spätesten verdingten Personen diejenigen im Vorschulalter eine geringere Selbstwirksamkeit im höheren Erwachsenenalter zeigen – unabhängig vom Zusammenhang zwischen Selbstwirksamkeit und Belastungsausmaß.

Parallel wurden solche Regressionen zur Vorhersage der Gewissenhaftigkeit mit den identischen Prädiktoren wie bei der Selbstwirksamkeit durchgeführt. Keiner der im Modell eingeführten Prädiktoren erreichte ein statistisch signifikantes Niveau ( $R^2 = .07, F(3, 107) = 1.67, p = .18$ ).

Ebenfalls wurde zur Vorhersage der Impulsivität eine Regression mit den identischen Prädiktoren durchgeführt. Einzig der CTQ-Gesamtwert fungierte als signifikanter Prädiktor ( $\beta = 0.20, p < .05$ ). Die erklärte Varianz im Modell betrug 6 % ( $R^2 = .06, F(3, 107) = .42, p = .74$ ). Aufgrund der  $\beta$ -Beträge lässt sich ablesen, dass in diese Prädiktion insbesondere eine kürzere Dauer der Verdingung ( $\beta = -0.30$ ) und das Säuglingsalter ( $\beta = 0.22$ ) den Zusammenhang miterklären.

## 4. Diskussion

Die vorliegende Studie ist unseres Wissens die erste, die in einer Population schwer belasteter und traumatisierter Kinder die Beziehung zwischen potentiellen Traumafaktoren und motivationalen Fähigkeiten im höheren Lebensalter untersuchte. Zunächst fand sich, dass vier Fünftel aller Teilnehmenden aversive oder traumatische Kindheitserfahrungen hatten mit emotionaler Vernachlässigung als der am häufigsten genannten Form. Diesbezüglich liegen vergleichbare Befunde für ähnliche Stichproben wie Pflegekinder vor (Pérez et al. 2011).

Aufgrund mangelnder Vorbefunde hinsichtlich der motivationalen Fähigkeiten (Simmen-Janevska et al. 2012), werden nachfolgend auch ähnliche Konzepte (u. a. Selbstaufwertung) miteinbezogen. Einige Ergebnisse sind als erster Hinweis zu werten, da die Unterschiede wohl auf Grund von zu geringer statistischer Power (die Altersgruppen sind jeweils nicht sehr groß) nicht statistisch signifikant sind (vgl. Abb. 1).

#### 4.1. Selbstwirksamkeit

Hypothesenkonform zeigten schwer in der Adoleszenz belastete oder traumatisierte Personen eine geringe Selbstwirksamkeit im Alter. Dieser Befund passt zu einer Studie, in der diejenigen, die während der Traumaexposition älter waren, Jahrzehnte später mehr posttraumatische Symptome berichteten als diejenigen, die jünger waren (Cohen et al. 2003). Die Autoren argumentieren, dass Adoleszente die Fähigkeit ausbilden, ihre eigene Vulnerabilität wahrzunehmen und auf diese Weise die Bedrohung durch das traumatische Erlebnis und die Bedeutung des Traumas evaluieren können. Diese Erklärung kann auch auf die Beziehung zwischen potentiellen Traumafaktoren und Selbstwirksamkeit übertragen werden. Obwohl die in der Adoleszenz Verdingten signifikant weniger aversive Erfahrungen berichteten als die im Säuglingsalter Verdingten, haben die ersten möglicherweise ihre aversiven oder traumatischen Erlebnisse auch als solche eingeschätzt und sich dadurch eingeschränkt und handlungsunfähig erlebt. Auch nach der Theorie der „Erschütterten Einstellungen“ (Janoff-Bulman 1992) schädigt ein Trauma die Einstellungen über das Selbst und die Welt, sodass sich die Betroffenen nicht mehr als kompetent und unverwundbar wahrnehmen. Demzufolge kann das heißen, dass die Art und Intensität der Aversität oder Traumatisierung bei den Adoleszenten, die bereits ausgebildete Einstellungen über sich selbst hatten, eher einen Unterschied für die Selbstwirksamkeit im Erwachsenenalter gemacht haben als bei den jünger Verdingten, bei denen dieser Zusammenhang sich nicht abzeichnen scheint.

Mit dem Ziel, den schädlichen Effekt des Kindesmissbrauchs auf das Selbstsystem zu untersuchen, prüften Kim und Cicchetti (2003) den Zusammenhang zwischen Kindesmissbrauch und sozialer Selbstwirksamkeit. Jüngere missbrauchte Kinder (< 8 Jahre) zeigten in konflikthaften Interaktionen ein überhöhtes Niveau an Selbstwirksamkeit im Vergleich zu nichtmissbrauchten Kindern. Es scheint, dass ungefähr im Alter von acht Jahren starke Veränderungen hinsichtlich des Selbstverständnisses stattfinden und die Überbewertung der wahrgenommenen sozialen Kompetenz der jüngeren missbrauchten Kinder auf eine defizitäre Wahrnehmung und Missinterpretation der sozialen Informationsprozesse zurückzuführen ist. Möglicherweise kann der fehlende Zusammenhang zwischen Selbstwirksamkeit und Kindheitsaversitäten (Synonym für „aversive oder traumatische Erfahrungen“) in unserem Sample bis zum zehnten Lebensjahr dadurch erklärt werden, dass die überhöhte Einschätzung der sozialen Selbstwirksamkeit bis ins hohe Alter erhalten bleibt, weil durch die Aversität oder das Trauma die Ausbildung kompetenzbasierter Selbstkognitionen verhindert wurde. Nichtsdestotrotz ist auch bei dieser Erklärung Vorsicht geboten, weil es

sich in den beiden Studien um unterschiedliche Facetten der Selbstwirksamkeit handelt.

#### 4.2. Gewissenhaftigkeit

Schwer in der Adoleszenz belastete oder traumatisierte Personen zeigten sich weniger gewissenhaft im Alter und umgekehrt, gewissenhafte Ältere berichten weniger Aversitäten während der Adoleszenz. Für die erstgenannte Betrachtungsweise gibt es keinen vergleichbaren Vorbefund. Letztere Betrachtungsweise stimmt mit einer Längsschnittuntersuchung überein, in der Gewissenhaftigkeit als eine Coping-Ressource fungierte (Löckenhoff et al. 2009). Hohe Gewissenhaftigkeitswerte vor dem stressreichen Event hatten einen günstigeren Verlauf hinsichtlich der psychischen Gesundheit zur Folge. Allerdings handelte es sich hierbei um Traumatisierte im Erwachsenenalter. Unser Ergebnis steht im Einklang mit einer Studie, in der Studierende mit einer hohen PTBS-Symptomatik eine geringere Gewissenhaftigkeit zeigten im Vergleich zu Studierenden mit einer wenig ausgeprägten PTBS-Symptomatik (Rubin et al. 2008). Dies wurde insbesondere für die Aversität emotionale Vernachlässigung in der Kindheit gefunden, die negativ mit Gewissenhaftigkeit korrelierte (Mathews et al. 2008). In der vorliegenden Studie war emotionale Vernachlässigung die am meisten genannte Form der Kindheitsaversitäten. Möglicherweise berichten insbesondere stark emotional vernachlässigte Personen geringe Gewissenhaftigkeitswerte.

#### 4.3. Impulsivität

Dass die positive Beziehung zwischen Kindheitsaversitäten und Impulsivität in der Altersgruppe der am jüngsten Verdingten am größten sein wird, konnte teilweise bestätigt werden. Der höchste positive Zusammenhang war in der Altersgruppe „Vorschulalter“ zu finden. In diesem Alter scheint es hinsichtlich der späteren Impulsivität einen Unterschied zu machen, wie stark und welcher Art das aversive oder traumatische Erlebnis war. Dieser Befund korrespondiert mit den Ergebnissen zur Entwicklung der exekutiven Funktionen in der frühen Kindheit (Garon et al. 2008). Trotz der Entwicklung individueller Komponenten der exekutiven Funktionen im Säuglingsalter (< 3 Jahre), repräsentiert das Vorschulalter (3–5 Jahre) einen Meilenstein, da sich dann das Aufmerksamkeitssystem entwickelt und Verbindungen mit anderen Hirnregionen etabliert. Wir können davon ausgehen, dass aversive oder traumatische Erfahrungen während dieser vulnerablen Phase zur späteren maladaptiven Entwicklung der Selbstkontrolle beigetragen haben könnten.

#### 4.4. Motivationale Fähigkeiten

Die zweite Frage war, ob sich die motivationalen Fähigkeiten in den verschiedenen Altersgruppen der Erstverdingung voneinander unterschieden. Im einfachen Altersgruppenvergleich resultierten keine signifikanten Unterschiede. Dieser Befund steht im Widerspruch zur bisherigen Forschung (Maercker u. Herrle 2003). Allerdings wurden in der vorliegenden Studie intrapsychische motivationale Faktoren als Trau-

mafolgen berücksichtigt und nicht die üblichen psychopathologischen Symptome und Diagnosen, was diese Inkonsistenz erklären könnte. In einer früheren Studie mit während des Zweiten Weltkriegs evakuierten Kindern wurde Selbstkritik (Nichterfüllung der internalen Erwartungen und Standards) als Maß der psychischen Gesundheit eingesetzt und korrelierte mit dem Alter bei der Evakuierung (Rusby u. Tasker 2009). Fand die Evakuierung in der frühen Kindheit (4–6 Jahre) statt, zeigten die Personen 60 Jahre später ein hohes Level an Selbstkritik. Betrachtet man das Konzept Selbstkritik sowie die motivationalen Fähigkeiten als Teile des Bewertungssystems, so wäre auch in unserer Studie zu erwarten gewesen, dass jünger verdingte Kinder eine größere Beeinträchtigung der motivationalen Fähigkeiten im Alter aufweisen müssten. Demgegenüber fand eine Längsschnittstudie bei sechsjährigen missbrauchten Kindern eine geringere Gewissenhaftigkeit als bei nichtmissbrauchten Kindern. Drei Jahre später blieben die Gewissenhaftigkeitswerte bei den missbrauchten Kindern auf tiefem Niveau stabil und unterschieden sich signifikant von den Werten der Kontrollgruppe (Rogosch u. Cicchetti 2004). Die Frage, warum sich die motivationalen Fähigkeiten in den verschiedenen Altersgruppen in dieser Studie nicht voneinander unterscheiden, kann an dieser Stelle nicht abschließend beantwortet werden.

Bei der weiterführenden multivariaten Analyse fand sich allerdings, dass Geschlecht, CTQ-Gesamtwert und ein jüngerer Alter bei der Erstverdingung am meisten Varianz in der Selbstwirksamkeit aufklärten. Im Vergleich zu in der Adoleszenz Verdingten weisen im Vorschulalter Verdingte eine signifikant geringere Selbstwirksamkeit auf. Es zeigte sich weiterhin, dass sich Männer selbstwirksamer beurteilten als Frauen. Die aufgeklärte Varianz in diesem Modell war allerdings nur marginal signifikant.

Zusammengefasst lassen sich die motivationalen Fähigkeiten bei Älteren mit frühen Aversitäten oder Traumatisierungen auf der obersten Analyseebene im Erstverdingungs-Altersgruppenvergleich nicht voneinander unterscheiden. Hinsichtlich bestimmter Alterstrends deuten die genaueren Analysen darauf hin, dass eine bedeutende Beziehung zwischen einer potentiellen Traumatisierung und Selbstwirksamkeit sowie einer potentiellen Traumatisierung und Gewissenhaftigkeit bei Personen, die ab dem zehnten Lebensalter verdingt wurden, besteht. Maercker et al. (2004) fanden Hinweise darauf, dass traumatische Erfahrungen in der Kindheit ( $\geq 12$  Jahren) anders verarbeitet werden als in der Adoleszenz. Möglicherweise trifft diese Argumentation auch in Bezug auf die motivationalen Fähigkeiten zu. Die Fähigkeit zur Selbstkontrolle (oder Impulsivität) scheint jedoch schon im früheren Alter dem schädlichen Einfluss einer aversiven oder traumatischen Erfahrung zu unterliegen.

Bei der Interpretation der Ergebnisse müssen einige methodische Einschränkungen berücksichtigt werden. Die Analysen sind weitgehend auf deskriptiver Ebene erfolgt und entsprechend vorsichtig zu interpretieren. Weiterhin ist infolge des Querschnittsdesigns auch die umgekehrte Beziehung denkbar, dass bei Personen, die in der frühen Adoleszenz verdingt wurden, eine hohe Selbstwirksamkeit mit einem geringen CTQ-Gesamtwert assoziiert ist. Zudem wurde nicht erfragt, ob vor der behördlichen Fremdplatzierung allfällige aversive oder traumatische Erlebnisse in der Herkunftsfamilie vorhanden waren. Weiter wurden nur Personen befragt, die sich frei-

willig zur Teilnahme an der Studie meldeten. Es ist nicht auszuschließen, dass sich insbesondere diejenigen gemeldet haben, die ihre Erfahrungen als besonders belastend erlebt haben. Infolge dieser Selektion ist die Repräsentativität der Ergebnisse auf die gesamte Population der ehemaligen Verdingkinder eingeschränkt. Ferner handelt es sich bei allen Aussagen zu den Kindheitserfahrungen um retrospektive Selbstausskünfte der Betroffenen, die durch die Beurteilung und Interpretation Jahrzehnte später möglicherweise verzerrt wurden und deren Validität in Frage gestellt werden könnte (Hardt u. Rutter 2004). Schließlich war die interne Konsistenz der Subskala CTQ-KV unbefriedigend. Aufgrund der Konsistenz dieses Ergebnisses mit anderen Befunden (Bader et al. 2009) wurde die Subskala trotzdem eingesetzt.

Trotz der aufgeführten Schwächen liegt die Stärke der Studie in der Besonderheit der untersuchten Stichprobe der ehemaligen Verdingkinder. Die Studie stellt einen ersten Schritt in der Beantwortung der Frage dar, ob aversive und potentielle traumatische Erfahrungen die motivationalen Fähigkeiten beeinflussen, die für die Bewältigung des weiteren Lebens wichtig sind. Es wäre wichtig, den Einfluss aversiver und traumatischer Erfahrungen auf die motivationalen Faktoren längsschnittlich zu untersuchen.

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